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June 9, 1998

U.S. Environmental Protection Agency
Emergency Response Office
75 Hawthorne Street
San Francisco, California 94105

Ref. No.: T190698-004
TDD: 099803-0006
PAN: 0294WDSF-XX

Attention: K. Nelson, Project Officer

Subject: Waste Disposal, Incorporated Tank Assessment

In March 1998, the United States Environmental Protection Agency (EPA) requested assistance from Ecology and Environment, Inc.'s Superfund Technical Assessment and Response Team (START) for the evaluation of underground structures identified at the former Waste Disposal, Incorporated (WDI) site in Santa Fe Springs, Los Angeles County, California. WDI is a National Priorities List site that is currently under investigation by EPA's Emergency Response Team (ERT)

WDI is located on a large block of partially-developed land bordered by Greenleaf Avenue, Ann Street, Santa Fe Springs Road, and Los Nietos Road (Figure 1). The underground structures of concern for this report are located on the southwestern corner of WDI, in an area known as the Campbell property.

Based on historical information, ERT determined that up to 9 septic tanks with associated dry wells, and one underground fuel storage tank were potentially present on the Campbell property.

START's role in this investigation was to assist ERT by arranging analytical services and collecting appropriate samples, under proper EPA quality assurance protocols, from these underground structures to determine their environmental hazard and danger to the public. ERT will be responsible for the interpretation of the resultant analytical data. Prior to sampling, START and ERT determined the appropriate analytical parameters to be investigated in these underground structures, via telephone conversations and START visits to the Campbell property site. The analytical parameters investigated included:

- Pesticides/polychlorinated biphenyls (PCBs) by EPA Method 8080
- Volatile organic compounds (VOCs) by EPA Method 8260A
- Semivolatile organic compounds (SVOCs) by EPA Method 8270
- Total cyanide by EPA Method 9010
- Total petroleum hydrocarbons (TPH) as gasoline and diesel, by modified EPA Method 8015
- 17 California metals by EPA 6000- and 7000-series methods.

Originally, 13 EPA Priority Pollutant metals were to be investigated. Upon ERT discussions with representatives of the city of Santa Fe Springs, the 17 metals regulated by California hazardous waste regulations were determined to be the proper suite for the best investigation of metals in the underground structures.

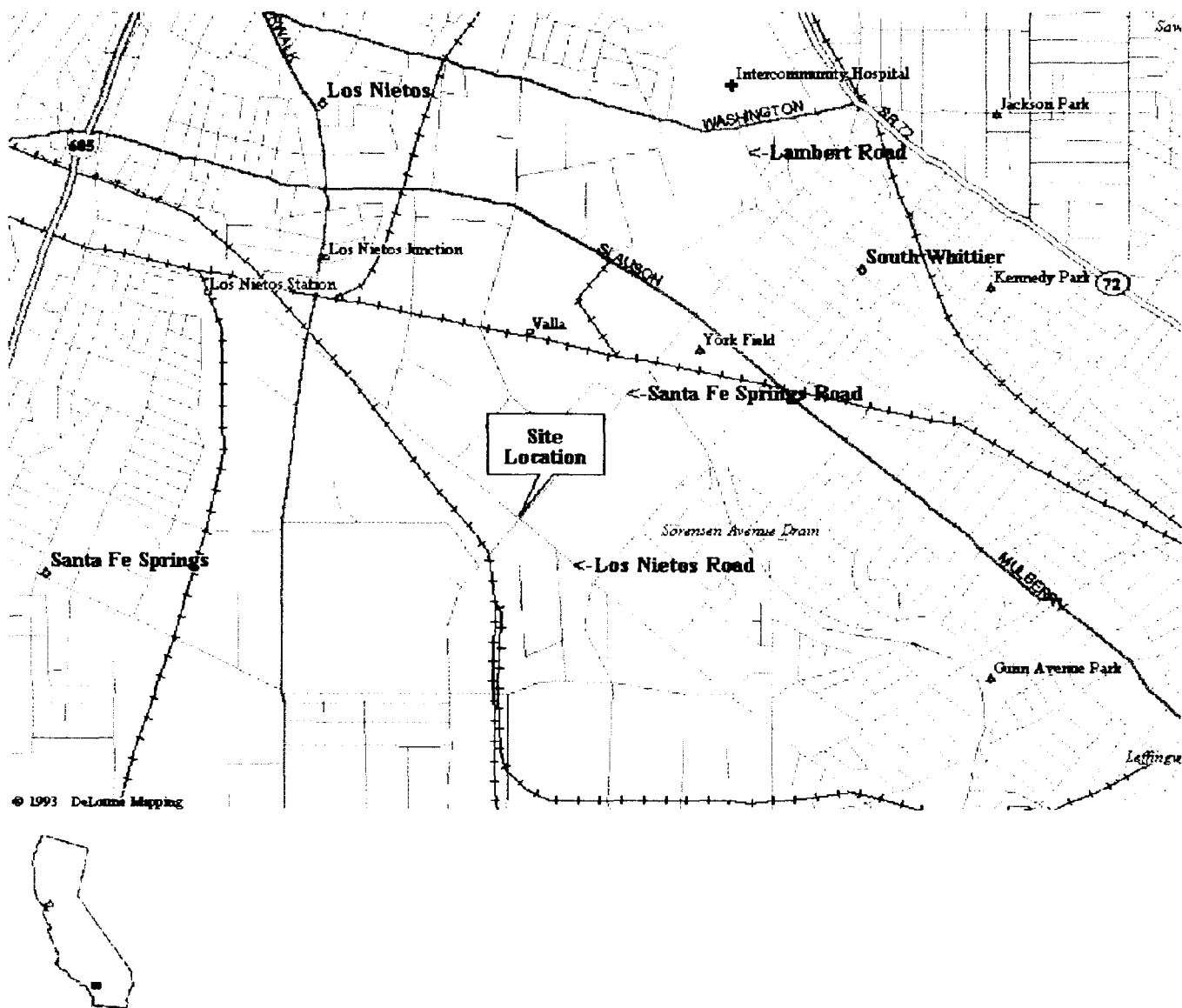


Figure 1
Site Location Map
WDI, Inc.
Santa Fe Springs, California

Prior to the sampling, START prepared a Quality Assurance Sampling Plan (QASP) to ensure proper quality assurance procedures were followed in the field (Attachment A).

During the period March 23 through April 6, 1998, ERT utilized a backhoe and historical information to uncover a total of three dual-chambered concrete septic tanks with associated dry wells; one four-chambered concrete sump; one single-chambered concrete sump; and one underground fuel tank. ERT was unable to identify the additional septic tanks which were referenced in historical records. Of the three brick-lined dry wells associated with the identified dual-chambered septic tanks, two had been filled in at some earlier date.

On April 6, 1998, START met with ERT at the site to conduct the sampling. A total of 13 sampling locations were designated by ERT: both chambers of each of three septic tanks, one dry well associated with the northern-most septic tank, each chamber of the four-chambered sump or clarifier, one single-chambered concrete sump, and the underground fuel tank (see Table 1). START collected the samples the same day, following procedures in the QASP and under requirements of a site-specific health and safety plan. In addition, START collected one blind duplicate sample, one background sample, and one equipment blank sample, and submitted two trip blanks with the sample coolers shipped to the laboratory. A schematic of sampling locations is provided in Figure 2.

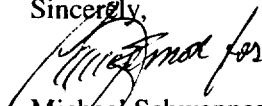
START utilized the analytical services of Sound Analytical Services, Inc., of Tacoma, Washington for sample analysis. The samples were received and analyzed within the holding time requirements designated in the QASP. Initial, unvalidated data sheets were provided to ERT immediately upon receipt by START. A data validation was subsequently conducted by a START chemist in accordance with the guidelines presented in the EPA document, *"Quality Assurance/Quality Control Guidance for Removal Activities; Sampling QA/QC Plan and Data Validation Procedures."* START-validated data sheets, appended to data validation summaries, are provided in Attachment B. All raw data generated by the laboratory will be maintained in START files.

The data indicated detectable concentrations of chlorinated pesticides in most of the samples, and detectable concentrations of PCBs in three of the samples. TPH detections were typically in the diesel range, at concentrations up to a maximum of 650 parts per million in sample ST-4A. Detectable and significant concentrations of metals were identified in most of the samples, but the background sample also contained significant concentrations of nine metals, including lead, chromium, and zinc. Low parts-per-billion-range VOCs were detected in most of the samples, but mainly in sample ST-4A. Higher molecular weight SVOCs were detected in all samples except ST-1B. Cyanide was not found in any of the samples investigated for this parameter.

Based on the data generated in this investigation, ERT will determine proper closure actions for the underground structures on the WDI Campbell property.

If you have any questions or comments regarding this investigation report, please contact me at 562/435-6188.

Sincerely,


Michael Schwennesen
START Team Member

Attachments

cc: file
C. Weden, FOSC

Table 1 START Sampling Locations, WDI Campbell Property		
Sample Number	Location/Matrix Description	Analytical Parameters
ST-1A	Southern-most septic tank, western chamber, which contained a single-phase wet, rocky soil.	VOCs Pesticides/PCBs CA metals SVOCs TPH
ST-1B	Southern-most septic tank, eastern chamber, which contained a single-phase wet, rocky soil.	VOCs Pesticides/PCBs CA metals SVOCs
ST-2A	Northeast septic tank, southern chamber, which contained a single-phase wet, rocky soil.	VOCs Pesticides/PCBs CA metals SVOCs TPH
ST-2B	Northeast septic tank, northern chamber, which contained a single-phase wet, rocky soil.	VOCs Pesticides/PCBs CA metals SVOCs
ST-3A	Southern-most chamber of a four-chambered sump or clarifier, containing a single liquid phase.	Total cyanide VOCs Pesticides/PCBs CA metals TPH
ST-3B	Second chamber of a four-chambered sump or clarifier, containing a single liquid phase.	Total cyanide VOCs Pesticides/PCBs CA metals TPH
ST-3C	Third chamber of a four-chambered sump or clarifier, containing a single liquid phase.	Total cyanide VOCs Pesticides/PCBs CA metals TPH
ST-3D	Northern-most, fourth chamber of a four-chambered sump or clarifier, containing a single liquid phase.	Total cyanide VOCs Pesticides/PCBs CA metals TPH

Table 1 START Sampling Locations, WDI Campbell Property		
Sample Number	Location/Matrix Description	Analytical Parameters
ST-3E	Blind duplicate of ST-3B	Total cyanide VOCs Pesticides/PCBs CA metals TPH
ST-4A	Northwest septic tank, southern chamber, which contained a single-phase wet, rocky soil	VOCs Pesticides/PCBs CA metals SVOCs TPH
ST-4B	Northwest septic tank, northern chamber, which contained a single-phase wet, rocky soil	VOCs Pesticides/PCBs CA metals SVOCs
DW-1	Dry well to the north of ST-4B, which contained a dry soil. Sample collected from approximately 20 feet below the top of the brick liner.	VOCs Pesticides/PCBs CA metals SVOCs TPH
ST-5	Single chambered concrete sump near the eastern edge of the Campbell property, which contained a single-phase wet sludge.	VOCs Pesticides/PCBs CA metals SVOCs TPH
UST-1	Apparent underground fuel tank located below a concrete foundation southwest of the ST-3 sumps, which contained a single-phase liquid.	VOCs Pesticides/PCBs CA metals TPH
BKG-1	Background sample from northeast fence line of Campbell property, which contained a single-phase dry soil.	VOCs Pesticides/PCBs CA metals SVOCs TPH
EB-1	Equipment blank	VOCs Pesticides/PCBs CA metals TPH
TB-1, TB-2	Trip blanks for two shipping coolers.	VOCs

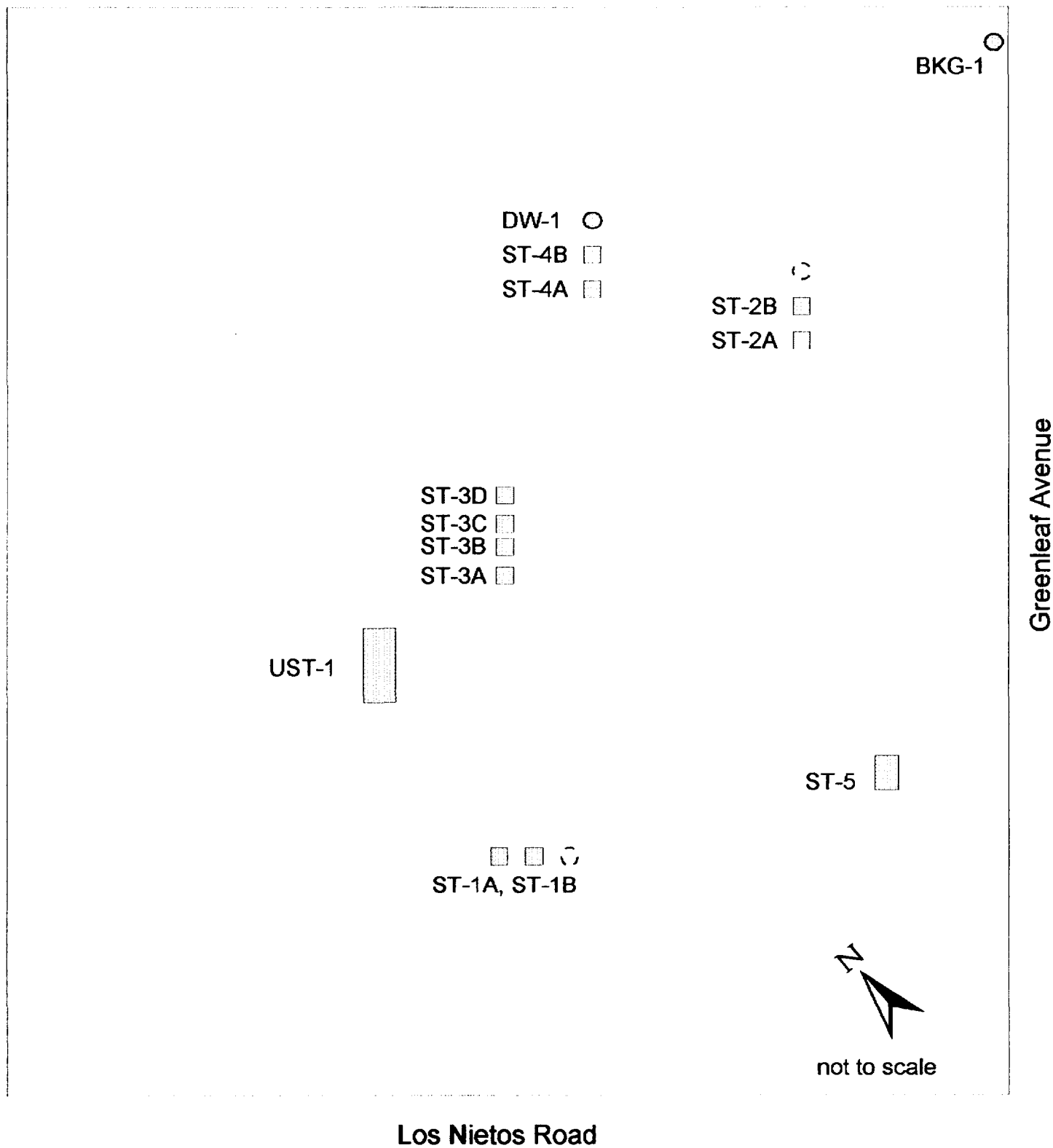


Figure 2
Schematic of Sample Locations
Campbell Property
WDI, Inc.

ATTACHMENT A

QUALITY ASSURANCE SAMPLING PLAN

**QUALITY ASSURANCE/QUALITY CONTROL
SAMPLING PLAN
(QASP)**

WDI Tank Assessment
Santa Fe Springs, California

March 30, 1998

EPA Project No.: KJ9103
Contractor Work Order No.: 09-9803-006
EPA Contract No.: 68-W6-0010

Approvals:

Howard Edwards
START Quality Assurance Officer

Date

Chris Weden
EPA Task Monitor

Date

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1.0 BACKGROUND

The former Waste Disposal, Inc. (WDI) property is located on a large block of partially-developed land bordered by Greenleaf Avenue, Ann Street, Santa Fe Springs Road, and Los Nietos Road in Santa Fe Springs, Los Angeles County, California. This Quality Assurance Sampling Plan (QASP) involves environmental sampling at the southeast corner of the block, known as the Campbell property, and bordered by Los Nietos Road and Greenleaf Avenue (Figure 1, Site Location Map).

The Campbell property contains approximately 25 concrete foundations, which were previously foundations for "Quonset" structures and which housed several small businesses. Reportedly, among these defunct businesses were metal finishing and automobile repair shops.

The U.S. Environmental Protection Agency's Emergency Response Team (ERT) has been tasked to conduct an assessment of the site, and will utilize the Superfund Technical Assessment and Response Team (START) for sampling logistics and analytical laboratory acquisition.

Based on historical information, ERT expects to locate and sample up to 9 septic tanks with associated dry wells, and one potential underground fuel storage tank. In addition, sampling may be conducted at any trenches or spreading grounds which may be found in the process of the investigation.

Proposed Site Work:

START will collect samples at locations designated by ERT, using EPA-promulgated quality assurance procedures. The resulting data will be validated and then provided to ERT, which will be responsible for the evaluation of the data.

2.0 DATA USE OBJECTIVES

The data generated by this investigation is expected to be of sufficient quality to provide information regarding contamination levels and assist in providing information for subsequent remediation scenarios at the sampled locations. The data will also provide ERT with sufficient information to satisfy the City of Santa Fe Springs in its requirements for the proper closure of the sampled underground tanks/structures.

3.0 QUALITY ASSURANCE (QA) OBJECTIVES

In order to fulfill the objectives in Section 2.0, all confirmation sample analyses will be performed by definitive methods and will include the receipt of Level IV-type data validation packages.

The quality assurance objectives for this assessment, as determined by the requirements stated in "Data Quality Objectives Process for Superfund" Interim Final Guidance, September, 1993, EPA/540/G-93/071, Publication No. 9355.9-01, are listed in the table below:

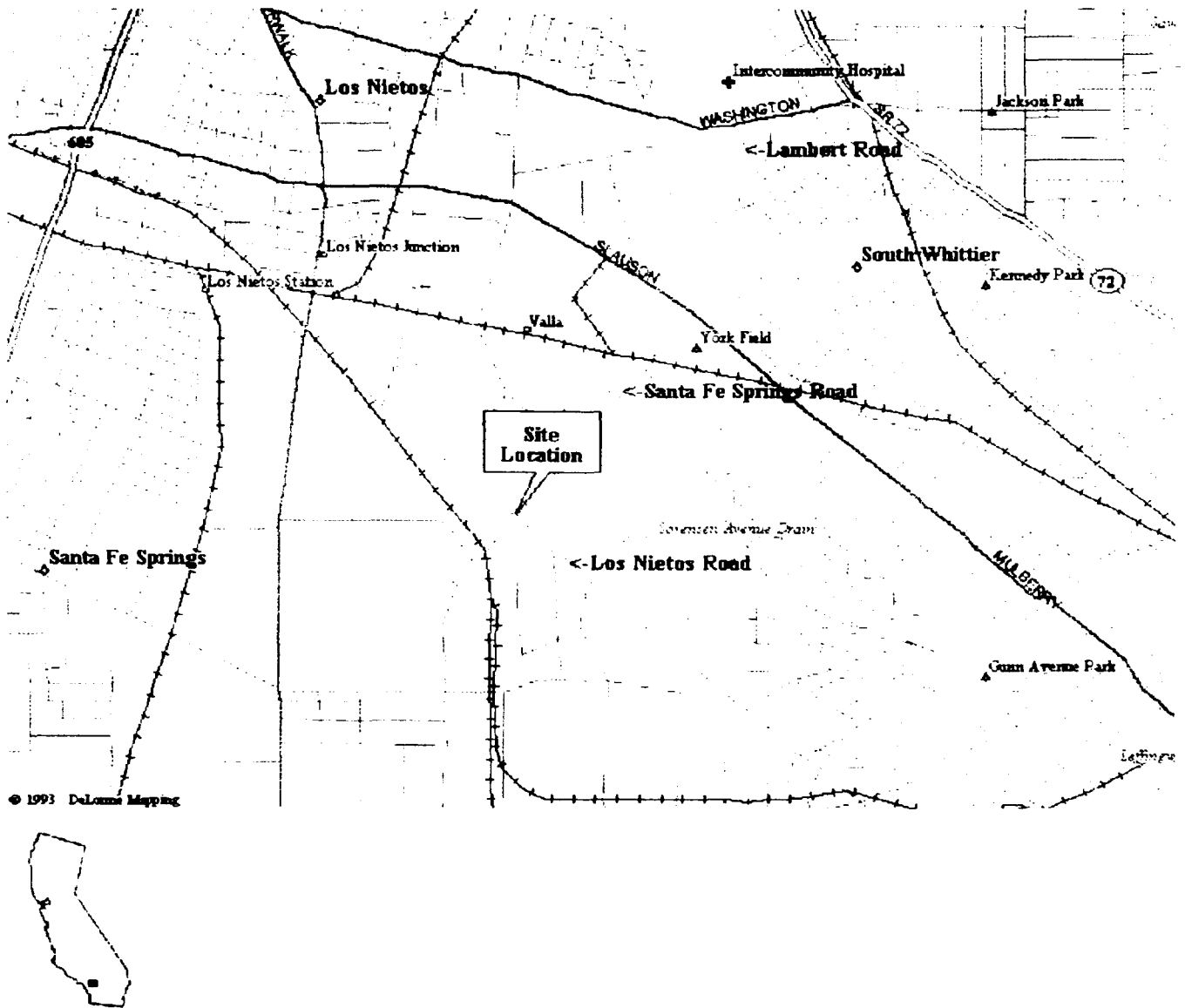


Figure 1
Site Location Map
WDI, Inc.
Santa Fe Springs, California

Table 1
Quality Assurance Objectives

Parameter	Matrix	Data Use	QA Objective
Volatile Organic Compounds, EPA Method 8260A	solid/liquid	Site Characterization	Definitive
Semivolatile Organic Compounds, EPA Method 8270	solid	Site Characterization	Definitive
Total Petroleum Hydrocarbons, EPA modified Method 8015	solid/liquid	Site Characterization	Definitive
Pesticides/PCBs EPA Method 8080	solid	Site Characterization	Definitive
California Metals, EPA 6,000- and 7,000-series methods	solid	Site Characterization	Definitive
Total and Reactive Cyanide, EPA Method 9010	solid/liquid	Site Characterization	Definitive

4.0 SAMPLING METHODS AND PROCEDURES

4.1 Septic Tank Sampling

Soil from backfilled septic tanks will be collected via a hand auger or slam bar corer device equipped with brass or stainless steel sleeves. Hand auger soil samples will be immediately placed in an eight-ounce glass jar, using a dedicated sampling spoon. Corer sleeve samples will be capped with Teflon sheeting and end caps. Sample jars and/or corer sleeves will be prepared for shipment to the analytical laboratory by:

- Taping the cap(s) with an appropriate (non-volatiles-generating) tape;
- Emplacing a sample label with appropriate information (Section 5.4);
- Emplacing a custody seal;
- Placing the sample in a sealed "baggie;"
- Storing the sample on ice.

Liquid or sludge found in any septic tank will be sampled by a ladle or sampling bomb as appropriate, decanted into an eight-ounce glass jar, and prepared for shipment as for soil samples.

4.2 Dry Well Sampling

Dry well sampling will be accomplished in the same manner as soil samples collected from septic tanks. Hand auger or corer rod extensions may be required to reach an appropriate depth of a dry well.

4.3 Underground Fuel Storage Tank Sampling

The underground storage tank is located beneath a concrete pad, which has a square hole cut in it to provide access to the contents of the tank. Preliminary site observations indicate that this tank is filled with water, and has settled debris on the bottom.

A liquid sample will be collected from this tank by disposable bailer, by drum thief, or by direct immersion of the sample container(s) into the water phase of the tank. The sample container(s) will then be prepared for shipment as described in Section 4.1.

An attempt will be made to sample sludge and/or debris from the bottom of the tank using a ladle-type device. If successful, the sample will be placed in an eight-ounce glass jar and prepared for shipment as described in Section 4.1.

4.4 Uncovered Trench and Spreading Ground Sampling

If trenches or spreading grounds are uncovered in the course of the investigation, these areas will be sampled by hand auger or slam bar corer as described in Section 4.1.

4.5 Sample Containers, Sample Volumes, Preservatives and Holding Times

Table 2 lists the required sample containers, sample volumes, preservation and holding times for individual analyses.

Table 2
Analytical Methods, Required Sample Containers, and Preservatives

Analytical Method	Sample Containers	Required Volume	Preservation	Holding Times
Liquid Volatile Organic Compounds EPA 8260A	40 ml VOA, no headspace, glass container, Teflon septa	Sample- 3x 40 ml MS/MSD- 4x40 ml	Store on ice Protect from light, preserve with HCl to pH<2	14 days
Liquid TPH EPA 8015 (modified)	as above	as above	Store on ice	14 days
Liquid Total Cyanide EPA 9010	1-liter polyethylene bottle	Sample- 1x 1 liter MS/MSD- 3x 1 liter	Store on ice, NaOH to pH >12	14 days
Solid TPH EPA 8015 (modified)	as above	as above	Store on ice	14 days
Solid Pesticides/PCBs EPA 8080	6" stainless steel or brass sleeve; or 8 oz. glass jar	1 sleeve or jar for sample/MS/MSD	Store on ice	7 days to extract; 40 days to analyze

Solid Volatile Organic Compounds EPA 8260	6" stainless steel or brass sleeve; or 8 oz. glass jar	1 sleeve or jar for sample/MS/MSD	Store on ice	14
Solid California Metals EPA 6,000 and 7,000 series	6" stainless steel or brass sleeve; or 8 oz. glass jar	1 sleeve or jar for sample/MS/MSD	Store on ice	6 months 28 days (Hg)
Solid Semivolatile Organic Compounds EPA 8270	6" stainless steel or brass sleeve; or 8 oz. glass jar	1 sleeve or jar for sample/MS/MSD	Store on ice	7 days to extract; 40 days to analyze

4.6 Decontamination Procedures

START will ensure that any non-dedicated field sampling equipment is properly decontaminated by washing in a phosphate-free detergent solution, and subsequent rinsing with potable water and deionized water.

4.7 Disposal of Investigation-Derived Waste

Any solid waste generated by START's sampling activities will be properly disposed of, either in receptacles for municipal trash (paper, label backings, tape, etc.) or in properly labeled drums of investigation-derived waste (PPE, rags or towels, etc.) which will be left on the site for later determination of the proper disposal option.

Decontamination water may be placed in a properly labeled drum and left on site, or, if only a small amount, the water may be allowed to evaporate in the decontamination vessels on site.

5.0 SAMPLE DOCUMENTATION AND SHIPMENT

All sample documents will be completed legibly in ink. Any corrections or revisions will be made by lining through the incorrect entry and by initialing the error.

5.1 Field Logbooks

The field logbook is essentially a descriptive notebook detailing site activities and observations so that an accurate account of field procedures can be reconstructed in the writer's absence. All entries will be dated and signed by the individuals making the entries and will include the following:

1. Site name and project number.
2. Names of personnel on-site.
3. Dates and times of all entries (military time preferred).
4. Descriptions of all site activities, including site entry and exit times.
5. Noteworthy events and discussions.
6. Weather conditions.
7. Site observations.
8. Identification and description of samples and locations.
9. Date and time of sample collections, along with chain of custody information.

10. Record of photographs.
11. Site sketches.

5.2 Sample Numbering and Identification

Samples will be identified with a unique sample location number (e.g., DW-1 "Dry Well 1"), followed by a six-digit date and a two-digit depth, if applicable. For example, DW-1-040298-15 would indicate a sample from Dry Well #1, collected on April 2nd, from a 15-foot depth. Trip blanks will be identified by the letters "TB," and date. Equipment blanks will be identified by the letters "EB," and date.

5.3 Sample Labels, Chain of Custody Records, Custody Seals

Sample Labels

Sample labels will clearly identify the particular sample and will include the following, written in indelible ink:

1. Site name and number.
2. Time and date sample was collected.
3. Sample preservation.
4. Analysis requested.
5. Sampler Name.

Sample labels will be securely affixed to the sample container.

Chain of Custody Record

A Chain of Custody record will be maintained from the time the sample is collected, to its final deposition. Every transfer of custody will be noted and signed for, and a copy of this record maintained by each individual who has signed. When samples (or groups of samples) are not under direct control of the individual responsible for them, they will be stored in a locked container sealed with a custody seal. The Chain-of-Custody record will include (at a minimum) the following:

1. Sample identification number.
2. Sample information.
3. Sample location.
4. Sample date.
5. Names(s) and signature(s) of sampler(s).
6. Signature(s) of any individual(s) with control over samples.

Custody Seals

Custody seals demonstrate that a sample container has not been tampered with, or opened. The individual in possession of the sample(s) will sign and date the seal, affixing it in such a manner that the container cannot be opened without breaking the seal.

5.4 Sample Handling and Shipment

Samples will be collected in the sample containers outlined in Table 2 and will be labeled and sealed in accordance to the protocol described in Section 4.1. Each sample collected will have the label affixed directly onto the container with a custody seal placed over or around the container cap. Upon collection, samples will be placed on ice.

After chilling, samples collected in glass containers will be wrapped with bubble wrap, sealed in plastic bags and placed in metal or plastic coolers chilled with double bagged ice, or blue ice. Samples for volatile organic analysis will be kept separate from other samples. After proper packaging, the Chain of Custody form will be placed in a plastic bag and affixed to the inside lid of the cooler. The cooler will then be sealed with tape and a minimum of three custody seals. An overnight air bill will be affixed to the cover of the cooler for immediate overnight shipment by Federal Express or other carrier.

5.5 Tentative Schedule of Activities

The following is a preliminary outline of proposed work activities. These dates may be subject to change based PRP activities:

<u>Activity</u>	<u>Proposed Start Date</u>	<u>Expected End Date</u>
Soil/Liquid/Sludge Sample Collection	04/01/98	04/01/98

6.0 ANALYTICAL METHODS AND PROCEDURES

6.1 Analytical Methods and Required Detection Limits

The analytical methods are presented in Table 1. Detection limits will be those generated by the analytical laboratory under the requirements of each specific EPA method. Samples will be prepared, analyzed, confirmed, documented, and reported as specified in each EPA method. The use of other analytical methods will not be acceptable for this work without prior authorization from the EPA Task Monitor and the START Project Manager.

6.2 Quality Control Samples

6.2.1 Field Duplicates

Field duplicates will be submitted for 10 percent of samples collected during each sampling event. If fewer than ten samples for a parameter are collected, one field duplicate will be collected and submitted. The PM will designate which samples will be the field duplicates. These samples will be assigned individual sample numbers as outlined in Section 5.0 and submitted blind to the laboratory.

6.2.2 Blank Samples

A minimum of one field blank and/or equipment blank sample will be submitted for analysis for each day of sampling. The blank sample will be collected utilizing distilled water. The water will be submitted to the lab as a regular blind sample, using a fabricated sample designation.

6.2.3 Matrix Spike and Matrix Spike Duplicate (MS/MSD) Samples

WDI Tank Assessment QASP
TDD#: 09-9803-006
March 30, 1998

Samples designated for MS/MSD will be submitted for 10 percent of samples collected during each sampling event. If fewer than ten samples for a parameter are collected, one sample for MS/MSD will be collected and submitted. The PM will designate which samples will be submitted as MS/MSDs. These samples will be assigned a sample number indicating location. MS/MSD will be added to the label and Chain of Custody form.

6.2.4 Trip Blanks

One trip blank will be carried into the field with the sample containers, and will be submitted to the laboratory with each set of samples being submitted for volatile organic compound analyses.

6.2.5 Background Sample

One background sample will be collected from an area appearing to reflect uncontaminated conditions. Such an area will likely be on a border of the property, near one of the adjacent roads.

6.3 Laboratory QC Sample Requirements

An outline of the type and frequency of laboratory QC check samples are presented in Table 3 along with Data Quality Objectives (DQOs) where applicable.

Table 3
Quality Control Samples and DQOs

QC Sample	Number/Frequency	DQO	Comments/Exceptions
Method Blank (MB)	1 per SDG*, per matrix, per method, per day	"Not Detect" for the analytical suite	
Matrix Spike	1 per SDG, per matrix, per method	75-125% Recovery	
Matrix Spike Duplicate	1 per SDG, per matrix, per method	≤ 25% RPD for organics	
Reference Standards	1 per SDG, per matrix, per method		
Internal Standards	All samples		All GC/ MS and some GC analyses only
Laboratory Control Standards	1 per SDG, per matrix, per method	75 - 125% Recovery	Per method for organic analyses

*SDG - Samples Delivery Group (Maximum 10 samples)

RPD - Relative Percent Difference

7.0 QUALITY ASSURANCE/QUALITY CONTROL REQUIREMENTS

7.1 QA/QC Requirements

The following general QA/QC requirements apply to the QA objectives and parameters identified in Section 2.0. In addition to the general QA/QC protocol, method-specific QA/QC requirements for sample analyses are to be achieved by the laboratory.

The following QA protocols for definitive data are applicable to all sample matrices specified in this QASP and include:

1. Sample documentation in the form of field logbooks, field data sheets, and chain of custody forms;
2. Instrument initial and continuing calibration and performance check procedures/methods will be summarized and documented in the instrument logbook;
3. Detection limit will be determined and recorded together with data as appropriate;
4. Analyte identification and quantification;
5. QC blanks will be analyzed;
6. Matrix spike recoveries will be documented;
7. Analytical error determination (measures precision of analytical method); and
8. Total measurement error determination (measures overall precision of the measurement system from sample acquisition through analysis).

The type and frequency of laboratory QC checks are listed in Table 3, which also summarizes data quality objectives (duplicate precision and percent recovery). Table 1 includes the method number, required analyte and method detection limits for each method.

7.2 Turnaround Time

Preliminary data summaries for soil and groundwater sample analyses are requested on a standard 14-day turnaround basis by fax or computer e-mail. A hard copy of this information is also requested on a standard turnaround basis. A full data validation package is requested 30 days from the analysis of samples.

7.3 Deliverable Packages

The data package for definitive level data shall include all original documentation generated in support of this analytical project. In addition, the laboratory shall provide original documentation to ensure that all requirements of the methods have been met. This includes but is not limited to, sample tags, custody records, shipping information, sample preparation/extraction records and instrument printouts such as mass spectra. When information and documentation required in this document or required method records are in permanently bound notebooks and computer files, copies of the appropriate information are acceptable.

The following deliverables are required for definitive data. Note that the following data requirements are included to specify and emphasize general documentation requirements and are not intended to supersede or change requirements of each method.

- Copies of the original sample packing list, chain of custody, and sample log-in records.
- A case narrative describing the analyses and methods used, the criteria used to qualitatively identify Tentatively Identified Compounds (TICs), and discussing the presence of any interferences and failure of the lab to meet any of the requirements or reanalyses.
- Analytical data (results) up to three significant figures for all samples, method blanks, MS/MSDs, LCS, duplicates, Performance Evaluation (PE) samples, and field QC samples.
- QC Summary sheets: EPA CLP-equivalent forms which summarize the following:

Organics/Inorganics

1. MS/MSD/LCS recovery summary
2. Method/preparation blank summary
3. Initial and continuing calibration summary (including retention time windows)
4. Sample holding time and analytical sequence (i.e., extraction analysis)
5. Calibration curves and correlation coefficients
6. Duplicate summary
7. Detection limit information
8. Analyst bench records describing dilution, weighing of samples, percent moisture (solids), sample size, sample extraction and cleanup, final extract volumes and amount injected
9. Detailed explanation of the quantitation and identification procedure used, giving examples of calculations from raw data
10. The final deliverable report will consist of sequentially numbered pages.

Additional requirements for organics:

1. Internal/surrogate recoveries
2. GC/MS tuning conditions summary
3. Reconstructed ion current chromatogram and quantitation reports for all samples, standards, blanks, MS/MSD and PE samples.
4. For every compound identified in each field sample, provide raw versus enhanced spectra and enhanced versus reference spectra
5. For target analytes, the reference spectrum shall be the check standard for that sample. For TICs, the reference mass spectrum shall be the best fit spectrum from a search of the spectral library.
6. Confirmation analysis data - second column confirmation required for all TICs (GC analyses such as chlorinated pesticides and PCBs). Provide all associated raw data and summary sheets for the confirmation analyses.

All sample results, including QA/QC sample results shall also be provided to the START on a 3.5" disk in any of the following formats: fixed-width ASCII (space delimited ASCII), Lotus 1-2-3 or Approach, Microsoft Excel or Access, or Paradox. The following should be provided in separate fields:

- START sample number
- Laboratory sample number
- Sample matrix
- Analyte
- Result
- Qualifier
- Detection or quantitation limit
- Units
- Analytical method, and
- Date analyzed.

All analyses for unique sample delivery groups should be analyzed in uninterrupted batches on a single instrument except for required QC sample analyses. Preparation batches should include the same sample as instrument batches. If specific groups have not been identified on the chain of custody form, the laboratory may assemble the samples into groups at its own discretion.

7.4 Data Review/Validation Requirements

Data Validation of Definitive Data Packages

Data validation will be conducted by a START chemist in accordance with the guidelines presented in the EPA document "*Quality Assurance/Quality Control Guidance for Removal Activities; Sampling QA/QC Plan and Data Validation Procedures.*"

Specific validation activities include the following:

1. The samples will be evaluated for holding times, field blank contamination, matrix spike recovery for the sample lot, analyte identification and quantitation and surrogate recovery.

2. The analytical system will be evaluated for precision, accuracy and overall function through evaluation of initial and continuing calibrations, instrument blanks, method blanks, blank spikes, PE samples, interference check samples and detection limits.
3. The data package will be evaluated for completeness, chain of custody, laboratory comments and perceived problems.

8.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

EPA Regional Project Manager Andrea Benner, in conjunction with ERT project manager Bill Coakley, will provide overall direction to the Ecology & Environment, Inc. START staff concerning project needs, objectives and schedule. The START project manager, Michael Schwennesen, will be the primary point of contact for START field activities. Mr. Schwennesen will oversee and direct the sampling activities specified in this QASP. The START project manager will be responsible for the development and completion of the QASP, project team organization, and supervision of all project tasks, including reporting and deliverables. The START Site QC Coordinator, Howard Edwards, will be responsible for ensuring field adherence to the Sampling QASP and recording any deviations. The site QC coordinator is also the primary project team contact with the lab.

<u>Personnel</u>	<u>Responsibility</u>
Michael Schwennesen	Project Manager
QA/QC Coordinator	Howard Edwards
Judy Sapp	Field Technical Assistant

Analytical services will be provided by :

Sound Analytical Services, Inc.
4813 Pacific Highway East
Tacoma, WA 98424
(253) 922-2310

9.0 DELIVERABLES

The START Project Manager will maintain contact with the ERT project manager, and will keep him informed concerning the technical and financial progress of the project. Activities under this project will be reported in verbal and written status reports and other deliverables, such as analytical and final reports. Activities will also be summarized in appropriate format for inclusion in monthly and annual reports.

The following deliverables will be provided under this project:

Quality Assurance Sampling Plan

This document is meant to fulfill this requirement.

Data Validation Report

A review of the data generated under this plan will be performed by START, and appended to the analytical

WDI Tank Assessment QASP
TDD#: 09-9803-006
March 30, 1998

data package. The START data validation report will be prepared detailing analytical methods or procedures employed, sample results, QA/QC results, chain of custody documentation, laboratory correspondence, and raw data.

Final Report

A final report will be prepared to correlate available background information with data generated under this sampling project and identify supportable conclusions and recommendations which satisfy the objectives of this sampling QA/QC plan. A draft report will be submitted before the final report if so requested by the ERT project manager. The date and time for submittal of this report will be determined in the future by the ERT project manager.

ATTACHMENT B
DATA VALIDATION REPORTS

May 20, 1998
Project No. 201423-01

Ecology & Environment
11 Golden Shore, Suite 340
Long Beach, California 90802

Attention: Mr. Mike Schwennesen

Subject: Revised Data Validation
WDI Tank Assessment
Santa Fe Springs, California
TDD No. 09-9803-0006
PAN No. 0294-WDSF-XX

Dear Mr. Schwennesen:

In accordance with your request, Ninyo & Moore has performed data validation for the above referenced project site. The following reports document our review of the data, and our conclusions and qualifications. Seven validation deliverables were prepared according to "USEPA Quality Assurance/Quality control Guidance for Removal Activities" which is published by the Office of Solid Waste and Emergency Response (OSWER).

We appreciate the opportunity to be of service to you on this project. Should you have any questions, please contact the undersigned.

Sincerely,
NINYO & MOORE



Trisha J. Wooldslayer
Staff Environmental Scientist

TJW/DLR/av

Distribution: (1) Addressee



David L. Richter, R.E.A.
Senior Environmental Scientist

ANALYTICAL DATA REVIEW SUMMARY

Site Name: WDI Tank Assessment
Location: Santa Fe Springs, California
PAN No.: 0294-WDSF-XX
TDD No.: 09-9803-0006
Laboratory: Sound Analytical Services, Inc.
Sampling Date: April 6, 1998
Analytical Method: 8081/8082
Sample Matrix: Soil/water

Sample No.	Sample I.D.	Laboratory I.D.
1	ST-4A	71868-01
2	ST-4B	71868-02
3	ST-5	71868-03
4	DW-1	71868-04
5	BKG-1	71868-05
6	ST-3D	71868-07
7	ST-3E	71868-10
8	UST-1	71868-13
9	EB-1	71868-17
10	ST-1A	71868-19
11	ST-1B	71868-20
12	ST-2A	71868-21
13	ST-2B	71868-22
14	ST-3A	71868-25
15	ST-3B	71868-28
16	ST-3C	71868-31

Data Reviewer: Trisha J. Woolslayer *Trisha J Woolslayer 5/18/98*
Chemist QA Reviewer: _____
START PM Acceptance: _____

GENERAL METHODS DATA VALIDATION WORKSHEET - SUMMARY

Report No.: 71868
Laboratory: Sound Analytical Services, Inc.
Reviewer: Trisha J. Woolslayer
Review Date: May 14, 1998
Analytical Method: 8081/8082

No. of Samples Water: 7 Solid: 9 Other:

Indicate with a YES or NO whether each item is within QC limits.

1.	Holding Times	<u>Y</u>
2.	Surrogate Recovery	<u>*</u>
3.	Matrix Spike/Spike Duplicate	<u>*</u>
4.	Blanks	<u>Y</u>
5.	Initial Calibration	<u>Y</u>
6.	Continuing Calibration	<u>Y</u>
7.	Endrin/DDT Breakdown	<u>Y</u>
8.	Compound Identification	<u>*</u>
9.	Compound Quantitation	<u>Y</u>
10.	System Performance	<u>*</u>
11.	Overall Assessment	<u>*</u>

Other Problems/Comments: The sample matrix and types of preservative used were not reported on the chain-of-custody. CLP summary forms were not provided. Therefore, data was validated based on the raw data.

GC ORGANICS ANALYSES

DATA PACKAGE COMPLETENESS CHECKLIST

Checklist Code:	<u>X</u>	Included: no problems
	<u>*</u>	Included: problems noted in review
	<u>O</u>	Not Included and/or Not Available
	<u>NR</u>	Not Required
	<u>RS</u>	Provided As Re-submission

X Case Narrative

Quality Control Summary Package

<u>X</u>	Data Summary Sheets (Form 1)
<u>X</u>	Surrogate Recovery Summary (Form 2)
<u>X</u>	Matrix Spike/Spike Duplicates (Form 3)
<u>X</u>	Method Blank Summaries (Form 4)
<u>X</u>	Pesticide Evaluation Standards Summary (Form 8)
<u>O</u>	Pesticide/PCB Standards Summary (Form 9)
<u>O</u>	Pesticide/PCB Identification (Form 10)
	Other _____

Raw QC Data Package

<u>X</u>	Instrument Chromatograms*
<u>X</u>	Integration Results*
<u>X</u>	Confirmation Analysis Results
<u>X</u>	Copies of all Calculations of Results
<u>O</u>	List of Instrument Detection Limits
<u>X</u>	Chain-of-Custody Records
<u>X</u>	Sample Preparation and Analysis Run Logs
	Other _____

* Results for all samples, standards, blanks, MS/MSD and PE samples may be provided.

I. HOLDING TIMES

Acceptable X Outside QC Limits

Samples were extracted and analyzed within the prescribed holding time, except as noted under comments. Samples extracted and/or analyzed outside holding time requirements will be flagged (J) as estimated.

Holding time:

waters: 7 days
soil/sludges: 14 days
extracts: 40 days

Comments:

No comments.

II. INSTRUMENT PERFORMANCES

Acceptable X Outside QC Limits

All standards must be within established Retention Time (RT) windows. RT windows should be set at ± 3 times the standard deviation for three standard analyses over a 72 hour period. Breakdown of Endrin and 4,4'-DDT must be less than 20% for the mid-point DDT and Endrin check standard. This is determined as follows:

$$\begin{array}{l} \text{\% Breakdown} = \frac{\text{Total DDT degradation peak area (DDD + DDE)}}{\text{Total DDT peak (DDT+DDE+DDD)}} \times 100\% \\ \text{for 4,4'-DDT} \end{array}$$

Total endrin degradation peak area

$$\begin{array}{l} \text{\% Breakdown} = \frac{(\text{endrin aldehyde} + \text{endrin ketone})}{\text{Total endrin peak area (endrin} + \\ \text{for Endrin} \quad \quad \quad \text{endrin aldehyde} + \text{endrin ketone)}} \times 100\% \end{array}$$

The retention time for 4, 4'-DDT must be approximately 12 minutes.

If endrin and 4,4'-DDT breakdown exceeds 20%, all associated results are qualified as estimated (J). If the RT for 4,4'-DDT is significantly less than 12 minutes, the reviewer must evaluate the analyte resolution in calibration standards.

Comments:

No comments.

III. INITIAL AND CONTINUING CALIBRATION

Acceptable X Outside QC Limits

Verify that a five point initial calibration and a daily continuing calibration were analyzed for pesticides and that a one point, low level initial calibration standard was analyzed for each Aroclor. Check the laboratory's calculations of Percent Relative Standard Deviation (%RSD) and verify that the %RSD <20% for all analytes. In cases where this criteria is exceeded, all associated positive results are qualified as estimated (J). Check the laboratory's calculations of the Percent Difference (%D) between the initial calibration and the continuing calibration. In cases where the value for %D exceeds $\pm 15\%$, all associated data are flagged as estimated (J). In cases where the continuing calibration results are very low (%D is large and negative) associated results may be rejected ®. List all deviations and flagged results below.

Comments:

No comments.

IV. MATRIX SPIKE/SPIKE DUPLICATE RECOVERIES

Acceptable X Outside QC Limits

Matrix spike and spike duplicate recoveries should meet the laboratory QC criteria. In instances where the QC criteria are not met, the analyst should comment on whether the results appear to be due to matrix effects or some other cause. If the MS/MSD recovery was low, was a duplicate LCS provided after the MS/MSD analyses to prove that the low recovery was due to a matrix effect? List QC deviations below.

Comments:

No comments.

V. SURROGATE RECOVERIES

Acceptable _____ Outside QC Limits X

Tetrachloro-m-xylene (TMX) and decachlorobiphenyl (DCB) are utilized as surrogate standards. Confirm the surrogate recovery calculations for several samples. Verify that the percent recoveries are within the laboratory established limits. If surrogate recoveries exceed these limits, the associated results are qualified (J). If the surrogate was not recovered, the results are rejected (R) unless the extract required dilution.

Comments:

Surrogate recoveries for the following four samples were outside QC limits: ST-4B, UST-1, EB-1, ST-2A. This appears to be due to a matrix interference, and no data were qualified.

Several samples had surrogates which were not recovered due to dilutions.

VI. BLANKS

Acceptable X Outside QC Limits

Verify that a method blank was analyzed with each preparation batch of samples analyzed and that all blanks contain less than the Required Detection Limit (RDL) of any pesticide or interfering peak. Any analyte detected in the sample and also in the associated blank, must be qualified as non-detect (U) when the sample concentration is less than 5 times the blank concentration.

Comments:

No comments.

II. COMPOUND IDENTIFICATION

Any positive result must be verified using second column confirmation (or more rarely, by GC/MS confirmation). If qualitative criteria for second column confirmation are not met, the data must be flagged (NJ) as presumptively present at an estimated concentration. If a sample peak is outside of the retention time window in either the initial or confirmation analysis the result is also flagged (NJ). PCBs may not require second column confirmation if good pattern recognition has been established.

Comments:

Positive results with second column confirmation RPDs greater than 40% were qualified NJ. This qualification applies to the following samples: ST-4B, ST-3D, ST-2B, and ST-3A.

VIII. COMPOUND QUANTITATION/REPORTED DETECTION LIMITS

Verify that reported values, both positives and non-detects have been correctly adjusted to reflect dilutions, concentrations and clean-up procedures.

Comments:

No comments.

IX. OVERALL ASSESSMENT OF DATA

On the basis of this review, the following determination has been made with regard to the overall data usability for the specified level.

Acceptable	_____	Accepted with Qualification	<u> X </u>
Rejected	_____		_____

Accepted data meet the minimum requirements for the following EPA data category:

ERS Screening	_____
Non-definitive with 10% Conformation by Definitive Methodology	_____
Definitive	<u> X </u>
Without Comprehensive Statistical Error Determination	<u> X </u>
With Comprehensive Statistical error Determination	_____

Any qualifications to individual sample analysis results are detailed in the appropriate section above or appear under the comments section below. In cases where several QC criteria are out of specification, it may be appropriate to further qualify the data usability. The data reviewer must use professional judgment and express concerns and comments on the data validity for each specific data package.

Comments:

- *The sample matrix and types of preservative used were not reported on the chain-of-custody.*
- *CLP summary forms were not provided. Therefore, data was validated based on the raw data.*
- *Surrogate recoveries for the following four samples were outside QC limits: ST-4B, UST-1, EB-1, ST-2A. This appears to be due to a matrix interference, and no data were qualified. Several samples had surrogates which were not recovered due to dilutions.*
- *Positive results with second column confirmation RPDs greater than 40% were qualified NJ. This qualification applies to the following samples: ST-4B, ST-3D, ST-2B, and ST-3A.*

ANALYTICAL DATA REVIEW

APPENDIX A

DATA VALIDATION QUALIFIERS

The following list of data validation qualifiers may be used in this data review package:

J	The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or because quality control criteria were not met.
N	Presumptive evidence of presence of material.
NJ	Presumptive evidence of the presence of the material at an estimated quantity.
U	The material was analyzed for, but not detected. The associated numerical value is the sample detection limit or adjusted sample detection limit.
UJ	The material was analyzed for, but not detected. The reported detection limit is estimated because quality control criteria were not met.
R	The sample results are rejected (analyte may or may not be present) due to gross deficiencies in quality control criteria. Any reported value is unusable
RND	Recovery Not Determined (Optional).
PND	Precision Not Determined (Optional).

ANNOTATED DATA SUMMARY SHEETS

Hand-annotated copies of the Data Summary Sheets from the analytical data package follow. When appropriate, detection limits have been adjusted to reflect effects of relevant qualifications noted during the data review. Errors in the reporting of detected compound results will usually not be changed by hand. In these cases, the laboratory may be required to re-submit portions of the data package and any affected Data summary Sheets. Any additional quality control failures have been flagged using the above listed data validation qualifiers.

Pages of Annotated Data summary Sheets follow.

SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-4A
Lab ID:	71868-01
Date Received:	4/8/98
Date Prepared:	4/15/98
Date Analyzed:	4/19/98
% Solids	83.54
Dilution Factor	20

Organochlorine Pesticides and PCBs by USEPA Method 8081/8082

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	-	X8	63	149
Decachlorobiphenyl	-	X8	57	143

Sample results are on a dry weight basis.

Analyte	Result (ug/kg)	PQL	MDL	Flags
Aroclor 1016	ND	220	150	
Aroclor 1221	8500	440	260	C1
Aroclor 1232	ND	220	120	
Aroclor 1242	ND	220	78	
Aroclor 1248	ND	220	44	
Aroclor 1254	2500	220	71	C1
Aroclor 1260	ND	220	63	
Aldrin	ND	22	1.6	
alpha-BHC	ND	22	1.7	
beta-BHC	ND	22	3.1	
delta-BHC	ND	22	1.7	
gamma-BHC (Lindane)	ND	22	3.8	
Chlordane (technical)	ND	220	54	
4,4'-DDD	ND	44	3.8	
4,4'-DDE	ND	44	7.9	
4,4'-DDT	ND	44	28	
Dieldrin	ND	44	1.6	
Endosulfan I	ND	22	7.1	
Endosulfan II	ND	44	3.6	
Endosulfan sulfate	ND	44	5.3	
Endrin	ND	44	2.7	
Endrin aldehyde	ND	44	20	
Heptachlor	ND	22	2.2	
Heptachlor epoxide	ND	22	3.7	
Methoxychlor	ND	220	49	
Endrin ketone	ND	44	7	

5/18/98

SOUND ANALYTICAL SERVICES, INC.

Organochlorine Pesticides and PCBs by USEPA Method 8081/8082 data for 71868-01 continued...

Analyte	Result (ug/kg)	PQL	MDL
Toxaphene	ND	2200	960

5/18/98 *du*

SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-4B
Lab ID:	71868-02
Date Received:	4/8/98
Date Prepared:	4/15/98
Date Analyzed:	4/19/98
% Solids	79.84
Dilution Factor	5

Organochlorine Pesticides and PCBs by USEPA Method 8081/8082

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	97		63	149
Decachlorobiphenyl	273	X9	57	143

Sample results are on a dry weight basis.

Analyte	Result (ug/kg)	PQL	MDL	Flags
Aroclor 1016	ND	58	38	
Aroclor 1221	ND	120	68	
Aroclor 1232	ND	58	33	
Aroclor 1242	ND	58	20	
Aroclor 1248	ND	58	11	
Aroclor 1254	ND	58	19	
Aroclor 1260	ND	58	17	
Aldrin	ND	5.8	0.43	
alpha-BHC	ND	5.8	0.44	
beta-BHC	ND	5.8	0.82	
delta-BHC	ND	5.8	0.45	
gamma-BHC (Lindane)	ND	5.8	0.99	
Chlordane (technical)	330	58	14	C1
4,4'-DDD	ND	12	0.99	
4,4'-DDE	40	12	2.1	C2
4,4'-DDT	ND	12	7.2	
Dieldrin	74	12	0.41	C1
Endosulfan I	ND	5.8	1.9	
Endosulfan II	ND	12	0.96	
Endosulfan sulfate	ND	12	1.4	
Endrin	ND	12	0.7	
Endrin aldehyde	ND	12	5.1	
Heptachlor	ND	5.8	0.59	
Heptachlor epoxide	ND	5.8	0.96	
Methoxychlor	ND	58	13	
Endrin ketone	ND	12	1.8	

5/18/98

SOUND ANALYTICAL SERVICES, INC.

Organochlorine Pesticides and PCBs by USEPA Method 8081/8082 data for 71868-02 continued...

Analyte	Result (ug/kg)	PQL	MDL
Toxaphene	ND	580	250

5/18/98 (JW)

SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-5
Lab ID:	71868-03
Date Received:	4/8/98
Date Prepared:	4/15/98
Date Analyzed:	4/19/98
% Solids	76.18
Dilution Factor	1

Organochlorine Pesticides and PCBs by USEPA Method 8081/8082

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	109		63	149
Decachlorobiphenyl	85		57	143

Sample results are on a dry weight basis.

Analyte	Result (ug/kg)	PQL	MDL	Flags
Aroclor 1016	ND	13	8.6	
Aroclor 1221	ND	26	15	
Aroclor 1232	ND	13	7.3	
Aroclor 1242	ND	13	4.6	
Aroclor 1248	ND	13	2.6	
Aroclor 1254	650	13	4.2	C1
Aroclor 1260	ND	13	3.7	
Aldrin	ND	1.3	0.097	
alpha-BHC	ND	1.3	0.099	
beta-BHC	ND	1.3	0.18	
delta-BHC	ND	1.3	0.1	
gamma-BHC (Lindane)	ND	1.3	0.22	
Chlordane (technical)	ND	13	3.2	
4,4'-DDD	ND	2.6	0.22	
4,4'-DDE	20	2.6	0.47	C1
4,4'-DDT	ND	2.6	1.6	
Dieldrin	ND	2.6	0.092	
Endosulfan I	ND	1.3	0.42	
Endosulfan II	ND	2.6	0.22	
Endosulfan sulfate	ND	2.6	0.31	
Endrin	ND	2.6	0.16	
Endrin aldehyde	ND	2.6	1.2	
Heptachlor	ND	1.3	0.13	
Heptachlor epoxide	ND	1.3	0.22	
Methoxychlor	ND	13	2.9	
Endrin ketone	ND	2.6	0.41	

5/18/98 (24)

SOUND ANALYTICAL SERVICES, INC.

Organochlorine Pesticides and PCBs by USEPA Method 8081/8082 data for 71868-03 continued...

Analyte	Result (ug/kg)	PQL	MDL
Toxaphene	ND	130	57 5/18/98 (W)

SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	DW-1
Lab ID:	71868-04
Date Received:	4/8/98
Date Prepared:	4/15/98
Date Analyzed:	4/19/98
% Solids	78.68
Dilution Factor	50

Organochlorine Pesticides and PCBs by USEPA Method 8081/8082

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	-	X8	63	149
Decachlorobiphenyl	-	X8	57	143

Sample results are on a dry weight basis.

Analyte	Result (ug/kg)	PQL	MDL	Flags
Aroclor 1016	ND	600	400	
Aroclor 1221	ND	1200	720	
Aroclor 1232	ND	600	340	
Aroclor 1242	ND	600	210	
Aroclor 1248	ND	600	120	
Aroclor 1254	ND	600	200	
Aroclor 1260	ND	600	170	
Aldrin	120	60	4.5	C1
alpha-BHC	ND	60	4.6	
beta-BHC	ND	60	8.6	
delta-BHC	ND	60	4.7	
gamma-BHC (Lindane)	ND	60	10	
Chlordane (technical)	8100	600	150	C1
4,4'-DDD	ND	120	10	
4,4'-DDE	ND	120	22	
4,4'-DDT	ND	120	76	
Dieldrin	740	120	4.3	C1
Endosulfan I	ND	60	20	
Endosulfan II	ND	120	10	
Endosulfan sulfate	ND	120	15	
Endrin	ND	120	7.3	
Endrin aldehyde	ND	120	54	
Heptachlor	ND	60	6.2	
Heptachlor epoxide	ND	60	10	
Methoxychlor	ND	600	130	
Endrin ketone	ND	120	19	

5/18/98 (DW)

SOUND ANALYTICAL SERVICES, INC.

Organochlorine Pesticides and PCBs by USEPA Method 8081/8082 data for 71868-04 continued...

Analyte	Result (ug/kg)	PQL	MDL
Toxaphene	ND	6000	2600
			5/15/88 <i>(signature)</i>

SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	BKG-1
Lab ID:	71868-05
Date Received:	4/8/98
Date Prepared:	4/15/98
Date Analyzed:	4/19/98
% Solids	86.3
Dilution Factor	1

Organochlorine Pesticides and PCBs by USEPA Method 8081/8082

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	108		63	149
Decachlorobiphenyl	122		57	143

Sample results are on a dry weight basis.

Analyte	Result (ug/kg)	PQL	MDL	Flags
Aroclor 1016	ND	10	6.8	
Aroclor 1221	ND	21	12	
Aroclor 1232	ND	10	5.8	
Aroclor 1242	ND	10	3.7	
Aroclor 1248	ND	10	2	
Aroclor 1254	ND	10	3.3	
Aroclor 1260	ND	10	3	
Aldrin	ND	1	0.077	
alpha-BHC	ND	1	0.079	
beta-BHC	ND	1	0.15	
delta-BHC	ND	1	0.081	
gamma-BHC (Lindane)	ND	1	0.18	
Chlordane (technical)	ND	10	2.5	
4,4'-DDD	ND	2.1	0.18	
4,4'-DDE	ND	2.1	0.37	
4,4'-DDT	6	2.1	1.3	C1
Dieldrin	ND	2.1	0.073	
Endosulfan I	ND	1	0.33	
Endosulfan II	ND	2.1	0.17	
Endosulfan sulfate	ND	2.1	0.25	
Endrin	ND	2.1	0.12	
Endrin aldehyde	ND	2.1	0.92	
Heptachlor	ND	1	0.1	
Heptachlor epoxide	ND	1	0.17	
Methoxychlor	ND	10	2.3	
Endrin ketone	ND	2.1	0.33	

5/18/98


SOUND ANALYTICAL SERVICES, INC.

Organochlorine Pesticides and PCBs by USEPA Method 8081/8082 data for 71868-05 continued...

Analyte	Result (ug/kg)	PQL	MDL
Toxaphene	ND	100	45
			5/18/98 (ju)

SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-3D
Lab ID:	71868-07
Date Received:	4/8/98
Date Prepared:	4/13/98
Date Analyzed:	4/16/98
% Solids	-
Dilution Factor	1

Organochlorine Pesticides and PCBs by USEPA Method 8081/8082

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	58		30	122
Decachlorobiphenyl	64		59	126

Analyte	Result (ug/L)	PQL	MDL	Flags
Aroclor 1016	ND	0.094	0.063	
Aroclor 1221	ND	0.19	0.11	
Aroclor 1232	ND	0.094	0.054	
Aroclor 1242	ND	0.094	0.023	
Aroclor 1248	ND	0.094	0.028	
Aroclor 1254	ND	0.094	0.043	
Aroclor 1260	ND	0.094	0.036	
Aldrin	0.043	0.0094	0.0007	C1
alpha-BHC	ND	0.0094	0.00072	
beta-BHC	ND	0.0094	0.0013	
delta-BHC	ND	0.0094	0.00074	
gamma-BHC (Lindane)	ND	0.0094	0.0016	
Chlordane (technical)	2.8	0.094	0.023	C1
4,4'-DDD	0.076	0.019	0.0016	C1
4,4'-DDE	0.04	0.019	0.0034	C2 (NJ)
4,4'-DDT	ND	0.019	0.012	
Dieldrin	0.3	0.019	0.00067	C1
Endosulfan I	ND	0.0094	0.0031	
Endosulfan II	ND	0.019	0.0016	
Endosulfan sulfate	ND	0.019	0.0023	
Endrin	ND	0.019	0.0011	
Endrin aldehyde	ND	0.019	0.0084	
Heptachlor	ND	0.0094	0.00096	
Heptachlor epoxide	ND	0.0094	0.0016	
Methoxychlor	ND	0.094	0.021	
Endrin ketone	ND	0.019	0.003	

5/18/98
(signature)

SOUND ANALYTICAL SERVICES, INC.

Organochlorine Pesticides and PCBs by USEPA Method 8081/8082 data for 71868-07 continued...

Analyte	Result (ug/L)	PQL	MDL
Toxaphene	ND	0.94	0.51

5/18/98 (JW)


SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-3E
Lab ID:	71868-10
Date Received:	4/8/98
Date Prepared:	4/13/98
Date Analyzed:	4/16/98
% Solids	-
Dilution Factor	1

Organochlorine Pesticides and PCBs by USEPA Method 8081/8082

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	64		30	122
Decachlorobiphenyl	66		59	126

Analyte	Result (ug/L)	PQL	MDL	Flags
Aroclor 1016	ND	0.093	0.061	
Aroclor 1221	ND	0.19	0.11	
Aroclor 1232	ND	0.093	0.053	
Aroclor 1242	ND	0.093	0.023	
Aroclor 1248	ND	0.093	0.027	
Aroclor 1254	ND	0.093	0.042	
Aroclor 1260	ND	0.093	0.036	
Aldrin	ND	0.0093	0.00069	
alpha-BHC	ND	0.0093	0.00071	
beta-BHC	ND	0.0093	0.0013	
delta-BHC	ND	0.0093	0.00072	
gamma-BHC (Lindane)	ND	0.0093	0.0016	
Chlordane (technical)	0.76	0.093	0.023	C1
4,4'-DDD	ND	0.019	0.0016	
4,4'-DDE	ND	0.019	0.0033	
4,4'-DDT	ND	0.019	0.012	
Dieldrin	0.13	0.019	0.00066	C1
Endosulfan I	ND	0.0093	0.003	
Endosulfan II	ND	0.019	0.0015	
Endosulfan sulfate	ND	0.019	0.0022	
Endrin	ND	0.019	0.0011	
Endrin aldehyde	ND	0.019	0.0083	
Heptachlor	ND	0.0093	0.00094	
Heptachlor epoxide	ND	0.0093	0.0015	
Methoxychlor	ND	0.093	0.021	
Endrin ketone	ND	0.019	0.003	

5/18/98


SOUND ANALYTICAL SERVICES, INC.

Organochlorine Pesticides and PCBs by USEPA Method 8081/8082 data for 71868-10 continued...

Analyte	Result (ug/L)	PQL	MDL
Toxaphene	ND	0.93	0.5 <i>(Signature)</i> 5/18/98

SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	UST-1
Lab ID:	71868-13
Date Received:	4/8/98
Date Prepared:	4/13/98
Date Analyzed:	4/16/98
% Solids	-
Dilution Factor	1

Organochlorine Pesticides and PCBs by USEPA Method 8081/8082

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	50		30	122
Decachlorobiphenyl	6	X9	59	126

Analyte	Result (ug/L)	PQL	MDL	Flags
Aroclor 1016	ND	0.094	0.063	
Aroclor 1221	ND	0.19	0.11	
Aroclor 1232	ND	0.094	0.054	
Aroclor 1242	ND	0.094	0.023	
Aroclor 1248	5.1	0.094	0.028	C1
Aroclor 1254	ND	0.094	0.043	
Aroclor 1260	ND	0.094	0.036	
Aldrin	ND	0.0094	0.0007	
alpha-BHC	ND	0.0094	0.00072	
beta-BHC	ND	0.0094	0.0013	
delta-BHC	ND	0.0094	0.00074	
gamma-BHC (Lindane)	ND	0.0094	0.0016	
Chlordane (technical)	ND	0.094	0.023	
4,4'-DDD	ND	0.019	0.0016	
4,4'-DDE	ND	0.019	0.0034	
4,4'-DDT	ND	0.019	0.012	
Dieldrin	0.11	0.019	0.00067	C1
Endosulfan I	ND	0.0094	0.0031	
Endosulfan II	ND	0.019	0.0016	
Endosulfan sulfate	ND	0.019	0.0023	
Endrin	ND	0.019	0.0011	
Endrin aldehyde	ND	0.019	0.0084	
Heptachlor	ND	0.0094	0.00096	
Heptachlor epoxide	ND	0.0094	0.0016	
Methoxychlor	ND	0.094	0.021	
Endrin ketone	ND	0.019	0.003	

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SOUND ANALYTICAL SERVICES, INC.

Organochlorine Pesticides and PCBs by USEPA Method 8081/8082 data for 71868-13 continued...

Analyte	Result (ug/L)	PQL	MDL
Toxaphene	ND	0.94	0.51
			5/18/98 <i>[Signature]</i>


SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	EB-1
Lab ID:	71868-17
Date Received:	4/8/98
Date Prepared:	4/13/98
Date Analyzed:	4/16/98
% Solids	-
Dilution Factor	1

Organochlorine Pesticides and PCBs by USEPA Method 8081/8082

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	69		30	122
Decachlorobiphenyl	24	X9	59	126

Analyte	Result (ug/L)	PQL	MDL	Flags
Aroclor 1016	ND	0.093	0.061	
Aroclor 1221	ND	0.19	0.11	
Aroclor 1232	ND	0.093	0.053	
Aroclor 1242	ND	0.093	0.023	
Aroclor 1248	ND	0.093	0.027	
Aroclor 1254	ND	0.093	0.042	
Aroclor 1260	ND	0.093	0.036	
Aldrin	ND	0.0093	0.00069	
alpha-BHC	ND	0.0093	0.00071	
beta-BHC	ND	0.0093	0.0013	
delta-BHC	ND	0.0093	0.00072	
gamma-BHC (Lindane)	ND	0.0093	0.0016	
Chlordane (technical)	ND	0.093	0.023	
4,4'-DDD	ND	0.019	0.0016	
4,4'-DDE	ND	0.019	0.0033	
4,4'-DDT	ND	0.019	0.012	
Dieldrin	ND	0.019	0.00066	
Endosulfan I	ND	0.0093	0.003	
Endosulfan II	ND	0.019	0.0015	
Endosulfan sulfate	ND	0.019	0.0022	
Endrin	ND	0.019	0.0011	
Endrin aldehyde	ND	0.019	0.0083	
Heptachlor	ND	0.0093	0.00094	
Heptachlor epoxide	ND	0.0093	0.0015	
Methoxychlor	ND	0.093	0.021	
Endrin ketone	ND	0.019	0.003	

5/18/98


SOUND ANALYTICAL SERVICES, INC.

Organochlorine Pesticides and PCBs by USEPA Method 8081/8082 data for 71868-17 continued...

Analyte	Result (ug/L)	PQL	MDL
Toxaphene	ND	0.93	0.5
			④ 5/18/98

SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-1A
Lab ID:	71868-19
Date Received:	4/8/98
Date Prepared:	4/15/98
Date Analyzed:	4/18/98
% Solids	88.45
Dilution Factor	1

Organochlorine Pesticides and PCBs by USEPA Method 8081/8082

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	99		63	149
Decachlorobiphenyl	103		57	143

Sample results are on a dry weight basis.

Analyte	Result (ug/kg)	PQL	MDL	Flags
Aroclor 1016	ND	11	7	
Aroclor 1221	ND	21	12	
Aroclor 1232	ND	11	6	
Aroclor 1242	ND	11	3.7	
Aroclor 1248	ND	11	2.1	
Aroclor 1254	ND	11	3.4	
Aroclor 1260	ND	11	3	
Aldrin	ND	1.1	0.078	
alpha-BHC	ND	1.1	0.081	
beta-BHC	ND	1.1	0.15	
delta-BHC	ND	1.1	0.082	
gamma-BHC (Lindane)	ND	1.1	0.18	
Chlordane (technical)	ND	11	2.6	
4,4'-DDD	ND	2.1	0.18	
4,4'-DDE	ND	2.1	0.38	
4,4'-DDT	ND	2.1	1.3	
Dieldrin	ND	2.1	0.075	
Endosulfan I	ND	1.1	0.34	
Endosulfan II	ND	2.1	0.17	
Endosulfan sulfate	ND	2.1	0.25	
Endrin	ND	2.1	0.13	
Endrin aldehyde	ND	2.1	0.94	
Heptachlor	ND	1.1	0.11	
Heptachlor epoxide	ND	1.1	0.18	
Methoxychlor	ND	11	2.3	
Endrin ketone	ND	2.1	0.34	

5/18/98 (u)

SOUND ANALYTICAL SERVICES, INC.

Organochlorine Pesticides and PCBs by USEPA Method 8081/8082 data for 71868-19 continued...

Analyte	Result (ug/kg)	PQL	MDL
Toxaphene	ND	110	46

5/18/98 (signature)

SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-1B
Lab ID:	71868-20
Date Received:	4/8/98
Date Prepared:	4/15/98
Date Analyzed:	4/19/98
% Solids	86.27
Dilution Factor	1

Organochlorine Pesticides and PCBs by USEPA Method 8081/8082

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	94		63	149
Decachlorobiphenyl	104		57	143

Sample results are on a dry weight basis.

Analyte	Result (ug/kg)	PQL	MDL	Flags
Aroclor 1016	ND	11	7.1	
Aroclor 1221	ND	22	13	
Aroclor 1232	ND	11	6.1	
Aroclor 1242	ND	11	3.8	
Aroclor 1248	ND	11	2.1	
Aroclor 1254	ND	11	3.5	
Aroclor 1260	ND	11	3.1	
Aldrin	ND	1.1	0.08	
alpha-BHC	ND	1.1	0.083	
beta-BHC	ND	1.1	0.15	
delta-BHC	ND	1.1	0.084	
gamma-BHC (Lindane)	ND	1.1	0.19	
Chlordane (technical)	ND	11	2.6	
4,4'-DDD	ND	2.2	0.19	
4,4'-DDE	ND	2.2	0.39	
4,4'-DDT	ND	2.2	1.4	
Dieldrin	ND	2.2	0.077	
Endosulfan I	ND	1.1	0.35	
Endosulfan II	ND	2.2	0.18	
Endosulfan sulfate	ND	2.2	0.26	
Endrin	ND	2.2	0.13	
Endrin aldehyde	ND	2.2	0.96	
Heptachlor	ND	1.1	0.11	
Heptachlor epoxide	ND	1.1	0.18	
Methoxychlor	ND	11	2.4	
Endrin ketone	ND	2.2	0.34	

5/18/98


SOUND ANALYTICAL SERVICES, INC.

Organochlorine Pesticides and PCBs by USEPA Method 8081/8082 data for 71868-20 continued...

Analyte	Result (ug/kg)	PQL	MDL
Toxaphene	ND	110	47

5/18/98
(JW)

SOUND ANALYTICAL SERVICES, INC.


Client Name	Ecology & Environment, Inc.
Client ID:	ST-2A
Lab ID:	71868-21
Date Received:	4/8/98
Date Prepared:	4/15/98
Date Analyzed:	4/19/98
% Solids	87.95
Dilution Factor	5

Organochlorine Pesticides and PCBs by USEPA Method 8081/8082

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	104		63	149
Decachlorobiphenyl	198	X9	57	143

Sample results are on a dry weight basis.

Analyte	Result (ug/kg)	PQL	MDL	Flags
Aroclor 1016	ND	55	36	
Aroclor 1221	ND	110	65	
Aroclor 1232	ND	55	31	
Aroclor 1242	ND	55	20	
Aroclor 1248	ND	55	11	
Aroclor 1254	ND	55	18	
Aroclor 1260	ND	55	16	
Aldrin	ND	5.5	0.41	
alpha-BHC	ND	5.5	0.42	
beta-BHC	ND	5.5	0.78	
delta-BHC	ND	5.5	0.43	
gamma-BHC (Lindane)	ND	5.5	0.95	
Chlordane (technical)	120	55	13	C1
4,4'-DDD	ND	11	0.94	
4,4'-DDE	ND	11	2	
4,4'-DDT	ND	11	6.9	
Dieldrin	ND	11	0.39	
Endosulfan I	ND	5.5	1.8	
Endosulfan II	ND	11	0.91	
Endosulfan sulfate	ND	11	1.3	
Endrin	ND	11	0.66	
Endrin aldehyde	ND	11	4.9	
Heptachlor	ND	5.5	0.56	
Heptachlor epoxide	ND	5.5	0.92	
Methoxychlor	ND	55	12	
Endrin ketone	ND	11	1.8	

5/18/98


SOUND ANALYTICAL SERVICES, INC.

Organochlorine Pesticides and PCBs by USEPA Method 8081/8082 data for 71868-21 continued...

Analyte	Result (ug/kg)	PQL	MDL
Toxaphene	ND	550	240

5/18/98
JW

SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-2B
Lab ID:	71868-22
Date Received:	4/8/98
Date Prepared:	4/15/98
Date Analyzed:	4/19/98
% Solids	77.81
Dilution Factor	1

Organochlorine Pesticides and PCBs by USEPA Method 8081/8082

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	98		63	149
Decachlorobiphenyl	85		57	143

Sample results are on a dry weight basis.

Analyte	Result (ug/kg)	PQL	MDL	Flags
Aroclor 1016	ND	12	8.1	
Aroclor 1221	ND	24	14	
Aroclor 1232	ND	12	6.9	
Aroclor 1242	ND	12	4.3	
Aroclor 1248	ND	12	2.4	
Aroclor 1254	ND	12	4	
Aroclor 1260	ND	12	3.5	
Aldrin	ND	1.2	0.091	
alpha-BHC	ND	1.2	0.094	
beta-BHC	ND	1.2	0.17	
delta-BHC	ND	1.2	0.096	
gamma-BHC (Lindane)	ND	1.2	0.21	
Chlordane (technical)	11	12	3	J C1
4,4'-DDD	ND	2.4	0.21	
4,4'-DDE	ND	2.4	0.44	
4,4'-DDT	ND	2.4	1.5	
Dieldrin	6.5	2.4	0.087	C2 (NJ)
Endosulfan I	ND	1.2	0.4	
Endosulfan II	ND	2.4	0.2	
Endosulfan sulfate	ND	2.4	0.3	
Endrin	ND	2.4	0.15	
Endrin aldehyde	ND	2.4	1.1	
Heptachlor	ND	1.2	0.12	
Heptachlor epoxide	ND	1.2	0.2	
Methoxychlor	ND	12	2.7	
Endrin ketone	ND	2.4	0.39	

5/18/98 (m)

SOUND ANALYTICAL SERVICES, INC.

Organochlorine Pesticides and PCBs by USEPA Method 8081/8082 data for 71868-22 continued...

Analyte	Result (ug/kg)	PQL	MDL
Toxaphene	ND	120	53 5/18/98 <i>(Signature)</i>

SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-3A
Lab ID:	71868-25
Date Received:	4/8/98
Date Prepared:	4/13/98
Date Analyzed:	4/16/98
% Solids	-
Dilution Factor	1

Organochlorine Pesticides and PCBs by USEPA Method 8081/8082

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	65		30	122
Decachlorobiphenyl	73		59	126

Analyte	Result (ug/L)	PQL	MDL	Flags
Aroclor 1016	ND	0.098	0.065	
Aroclor 1221	ND	0.2	0.12	
Aroclor 1232	ND	0.098	0.056	
Aroclor 1242	ND	0.098	0.024	
Aroclor 1248	ND	0.098	0.029	
Aroclor 1254	ND	0.098	0.045	
Aroclor 1260	ND	0.098	0.038	
Aldrin	ND	0.0098	0.00073	
alpha-BHC	ND	0.0098	0.00075	
beta-BHC	ND	0.0098	0.0014	
delta-BHC	ND	0.0098	0.00077	
gamma-BHC (Lindane)	ND	0.0098	0.0017	
Chlordane (technical)	12	0.098	0.024	C1 D
4,4'-DDD	ND	0.02	0.0017	
4,4'-DDE	0.18	0.02	0.0035	C1
4,4'-DDT	ND	0.02	0.012	
Dieldrin	0.086	0.02	0.0007	C2 (NJ)
Endosulfan I	ND	0.0098	0.0032	
Endosulfan II	ND	0.02	0.0016	
Endosulfan sulfate	ND	0.02	0.0024	
Endrin	ND	0.02	0.0012	
Endrin aldehyde	ND	0.02	0.0088	
Heptachlor	0.019	0.0098	0.001	C2 (NJ)
Heptachlor epoxide	0.076	0.0098	0.0016	C2 (NJ)
Methoxychlor	ND	0.098	0.022	
Endrin ketone	ND	0.02	0.0031	

5/18/98
(JW)

SOUND ANALYTICAL SERVICES, INC.

Organochlorine Pesticides and PCBs by USEPA Method 8081/8082 data for 71868-25 continued...

Analyte	Result (ug/L)	PQL	MDL
Toxaphene	ND	0.98	0.53
			5/18/98 (u)

SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-3B
Lab ID:	71868-28
Date Received:	4/8/98
Date Prepared:	4/13/98
Date Analyzed:	4/16/98
% Solids	-
Dilution Factor	1

Organochlorine Pesticides and PCBs by USEPA Method 8081/8082

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	75		30	122
Decachlorobiphenyl	59		59	126

Analyte	Result (ug/L)	PQL	MDL	Flags
Aroclor 1016	ND	0.093	0.061	
Aroclor 1221	ND	0.19	0.11	
Aroclor 1232	ND	0.093	0.053	
Aroclor 1242	ND	0.093	0.023	
Aroclor 1248	ND	0.093	0.027	
Aroclor 1254	ND	0.093	0.042	
Aroclor 1260	ND	0.093	0.036	
Aldrin	ND	0.0093	0.00069	
alpha-BHC	ND	0.0093	0.00071	
beta-BHC	ND	0.0093	0.0013	
delta-BHC	ND	0.0093	0.00072	
gamma-BHC (Lindane)	ND	0.0093	0.0016	
Chlordane (technical)	1.1	0.093	0.023	C1
4,4'-DDD	ND	0.019	0.0016	
4,4'-DDE	ND	0.019	0.0033	
4,4'-DDT	ND	0.019	0.012	
Dieldrin	0.17	0.019	0.00066	C1
Endosulfan I	ND	0.0093	0.003	
Endosulfan II	ND	0.019	0.0015	
Endosulfan sulfate	ND	0.019	0.0022	
Endrin	ND	0.019	0.0011	
Endrin aldehyde	ND	0.019	0.0083	
Heptachlor	ND	0.0093	0.00094	
Heptachlor epoxide	0.068	0.0093	0.0015	C1
Methoxychlor	ND	0.093	0.021	
Endrin ketone	ND	0.019	0.003	

5/18/98 (u)

SOUND ANALYTICAL SERVICES, INC.

Organochlorine Pesticides and PCBs by USEPA Method 8081/8082 data for 71868-28 continued...

Analyte	Result (ug/L)	PQL	MDL
Toxaphene	ND	0.93	0.5

5/18/88 (signature)

SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-3C
Lab ID:	71868-31
Date Received:	4/8/98
Date Prepared:	4/13/98
Date Analyzed:	4/16/98
% Solids	-
Dilution Factor	1

Organochlorine Pesticides and PCBs by USEPA Method 8081/8082

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
TCMX	63		30	122
Decachlorobiphenyl	69		59	126

Analyte	Result (ug/L)	PQL	MDL	Flags
Aroclor 1016	ND	0.093	0.062	
Aroclor 1221	ND	0.19	0.11	
Aroclor 1232	ND	0.093	0.053	
Aroclor 1242	ND	0.093	0.023	
Aroclor 1248	ND	0.093	0.027	
Aroclor 1254	ND	0.093	0.043	
Aroclor 1260	ND	0.093	0.036	
Aldrin	ND	0.0093	0.0007	
alpha-BHC	ND	0.0093	0.00072	
beta-BHC	ND	0.0093	0.0013	
delta-BHC	ND	0.0093	0.00073	
gamma-BHC (Lindane)	ND	0.0093	0.0016	
Chlordane (technical)	0.97	0.093	0.023	C1
4,4'-DDD	ND	0.019	0.0016	
4,4'-DDE	ND	0.019	0.0034	
4,4'-DDT	ND	0.019	0.012	
Dieldrin	0.14	0.019	0.00067	C1
Endosulfan I	ND	0.0093	0.003	
Endosulfan II	ND	0.019	0.0016	
Endosulfan sulfate	ND	0.019	0.0023	
Endrin	ND	0.019	0.0011	
Endrin aldehyde	ND	0.019	0.0083	
Heptachlor	ND	0.0093	0.00095	
Heptachlor epoxide	0.06	0.0093	0.0016	C1
Methoxychlor	ND	0.093	0.021	
Endrin ketone	ND	0.019	0.003	

5/18/98
SW

SOUND ANALYTICAL SERVICES, INC.

Organochlorine Pesticides and PCBs by USEPA Method 8081/8082 data for 71868-31 continued...

Analyte	Result (ug/L)	PQL	MDL
Toxaphene	ND	0.93	0.51

5/18/98 (signature)

CHAIN OF CUSTODY RECORD

75 Hawthorne Street
San Francisco, California 94105

PROJ. NO.		PROJECT NAME				NO. OF CON- TAINERS	REMARKS					
SAMPLERS: (Signature)												
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION		VOCs EPA 8260	REST/PCBs EPA 8080	17 CALIFORNIA METALS	SVOCs EPA 8270	TOTAL CHLORIDE EPA 9010B	TPH (9+2) EPA 8015M
✓ ST-4	4/6	1559		X	ST-4A	2X40m	X	X	X	X	X	X
✓ ST-4		1608		X	ST-4B	2X40m	X	X	X	X	X	X
✓ ST-5		1630		X	ST-5	2X40m	X	X	X	X	X	X
✓ DW-1		1617		X	DW-1	2X40m	X	X	X	X	X	DO MS/MSD IF SUFFICIENT SAMPLE VOLUME
✓ BKG-1		1650		X	BKG-1	2X40m	X	X	X	X	X	
✓ ST-3		1545		X	ST-3D	2X1L			X	X		
✓ ST-3		1545		X	ST-3D	1X1L		X				
✓ ST-3		1545		X	ST-3D	4X40m	X				X	
✓ ST-3		1550		X	ST-3E	2X1L			X	X		
✓ ST-3		1550		X	ST-3E	1X1L		X				
✓ ST-3		1550		X	ST-3E	4X40m	X				X	
✓ UST-1		1635		X	UST-1	1X1L			X			* As requested in contract w/ Sound Laboratory
✓ UST-1		1635		X	UST-1	1X1L		X				
✓ UST-1		1635		X	UST-1	6X40m	X				X	
✓ TB		1800		X	TB-2 - 4/6/98	1X40m	X					
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Relinquished by: (Signature)		Date / Time		Received by: (Signature)		
M. Kellum		4/7/98 1200		FED-X								
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Relinquished by: (Signature)		Date / Time		Received by: (Signature)		
Relinquished by: (Signature)		Date / Time		Received for Laboratory by: (Signature)		Date / Time		Remarks				
				S. Giana		4/8/98 930AM		FED-X B/L # 804733300967				

**75 Hawthorne Street
San Francisco, California 94105**

[illegible]

CHAIN OF CUSTODY RECORD

PROJ. NO.		PROJECT NAME				NO. OF CON- TAINERS	ANALYSIS						REMARKS
KJ9103		WDI TANK ASSESSMENT					VOCs EPA 8260 PEST/PS EPA 8080 17 CALIFORNIA METALS SVOCs EPA 8270 TOTAL CYANIDE EPA 9010 TPH/gal EPA 8015						
SAMPLERS: (Signature) <i>M. Schumacher</i> <i>Jud. Sapp</i>													
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION								
ST-1	4/6	1420		X	ST-1A	2x40z	X	X	X	X	X		
ST-1		1425		X	ST-1B		X	X	X	X			
ST-2		1445		X	ST-2A		X	X	X	X	X		
ST-2		1451		X	ST-2B		X	X	X	X			
ST-3		1520		X	ST-3A	1x1L.				X		NaOH pH > 12	
ST-3		1520		X	ST-3A	1x1L.		X	X				
ST-3		1520		X	ST-3A	1x1L.	X						
ST-3		1520		X	ST-3A	6x40ml	X						
ST-3		1525		X	ST-3B	2x1L.		X		X		NaOH pH > 12 ON 9010 ANALYSIS	
ST-3		1525		X	ST-3B	1x1L.	X	X					
ST-3		1525		X	ST-3B	4x40ml	X			X		* AS REQUESTED IN CONTRACT w/ SOUND LABORATORY	
ST-3		1530		X	ST-3C	2x1LIT.		X		X			
ST-3		1530		X	ST-3C	1x1L.	X						
ST-3		1530		X	ST-3C	4x40ml	X						
TB		1800		X	TB-1-4/6/98	1x40ml	X						

Relinquished by: (Signature) <i>M. Schumacher</i>	Date / Time 4/7/98 1200	Received by: (Signature) FED-X	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) <i>S. Siano</i>	Date / Time 4/8/98 930AM	Remarks FED-X B/L # 804733300967	

SOUND ANALYTICAL SERVICES, INC.

Client: Ecology & Environment, Inc.

Date: April 29, 1998

Project: KJ9103 WDI Tank Assessment

Lab No.: 71868

SAMPLE EXTRACTION AND ANALYSIS

VOLATILE ORGANICS

Samples 71868-1 through 71868-5, 71868-19 through 71868-22 (soils) and 71868-8, 71868-11, 71868-14, 71868-15, 71868-18, 71868-26, 71868-29, 71868-32 and 71868-33 (liquids) were analyzed for volatile organics in accordance with EPA Method 8260. The soil samples were prepared and analyzed on 4-10-98. The liquid samples were prepared and analyzed on 4-10-98.

Sample 71868-14 was received at a pH of 7. Sample 71868-18 was received at a pH of 5.

All quality control was within the acceptance limits.

Acetone calculation from sample 71868-1

$$\frac{18.98 \times 5\text{ml}}{5.4507\text{g} \times 0.8354}$$

SEMIVOLATILE ORGANICS

Samples 71868-1 through 71868-5 and 71868-20 through 71868-22 (soils) were analyzed for semivolatile organics in accordance with EPA Method 8270. The samples were prepared and analyzed on 4-10-98.

All quality control was within the acceptance limits.

$$\frac{\text{Instrument reading} \times \text{final volume} \times \text{dilution factor}}{\text{sample weight or volume} \times \text{dry weight}}$$

PESTICIDES AND PCBs

Samples 71868-1 through 71868-5, 71868-19 through 71868-22 (soils) and 71868-7, 71868-10, 71868-13, 71868-17, 71868-25, 71868-28, and 71868-31 (liquids) were analyzed for pesticides and PCBs in accordance with EPA Method 8081. The soil samples were extracted on 4-15-98 analyzed on 4-18-98. The liquid samples were extracted on 4-13-98 and analyzed on 4-16-98.

Second column confirmation was performed. The values are flagged "C1" or "C2" as deemed appropriate.

The percent recovery of DCB (surrogate) in the method blank associated with the liquid samples failed low. Reanalysis exhibited similar results. Insufficient sample volume was available for reextraction and reanalysis.

All quality control was within the acceptance limits.

$$\frac{\text{Extract concentration} \times \text{extract volume} \times \text{dilution factor}}{\text{Sample volume or weight} \times \text{percent solids}}$$

ANALYTICAL DATA REVIEW SUMMARY

Site Name: WDI Tank Assessment
Location: Santa Fe Springs, California
PAN No.: 0294-WDSF-XX
TDD No.: 09-9803-0006
Laboratory: Sound Analytical Services, Inc.
Sampling Date: April 6, 1998
Analytical Method: 8260
Sample Matrix: Soil/Water

Sample No.	Sample I.D.	Laboratory I.D.
1	ST-4A	71868-01
2	ST-4B	71868-02
3	ST-5	71868-03
4	DW-1	71868-04
5	BKG-1	71868-05
6	ST-3D	71868-08
7	ST-3E	71868-11
8	UST-1	71868-14
9	TB-2-4/6/98	71868-15
10	EB-1	71868-18
11	ST-1A	71868-19
12	ST-1B	71868-20
13	ST-2A	71868-21
14	ST-2B	71868-22
15	ST-3A	71868-26
16	ST-3B	71868-29
17	ST-3C	71868-32
18	TB-1-4/6/98	71868-33

Data Reviewer: Trisha J. Woolslayer *Trisha J. Woolslayer* 5/15/98
Chemist QA Reviewer: _____
START PM Acceptance: _____

GC/MS METHODS DATA VALIDATION WORKSHEET – SUMMARY

Report No.: 71868
Laboratory: Sound Analytical Services, Inc.
Reviewer: Trisha J. Woolslayer
Review Date: May 14, 1998
Analytical Method: 8260

No. of Samples ____ Water: 9 Solid: 9 Other: ____

Indicate with a YES or NO whether each item is within QC limits.

1.	Holding Times	<u>Y</u>
2.	Surrogate Recovery	<u>Y</u>
3.	Matrix Spike/Spike Duplicate	<u>Y</u>
4.	Blanks	<u>Y</u>
5.	Initial Calibration	<u>*</u>
6.	Continuing Calibration	<u>*</u>
7.	Internal Standards	<u>Y</u>
8.	GC/MS Tune Performance	<u>Y</u>
9.	Compound Identification	<u>Y</u>
10.	Compound Quantitation	<u>Y</u>
11.	TIC Identification	<u>Y</u>
12.	System Performance	<u>Y</u>
13.	Overall Assessment	<u>*</u>

Other Problems/Comments: The sample matrix and the types of preservatives used were not re-
ported on the chain-of-custody. CLP summary sheets were not provided. Therefore, the data was
validated based on the raw data package.

GC/MS VOLATILE AND SEMI-VOLATILE ANALYSES

DATA PACKAGE COMPLETENESS CHECKLIST

Checklist Code:	<u>X</u>	Included: no problems
	<u>*</u>	Included: problems noted in review
	<u>O</u>	Not Included and/or Not Available
	<u>NR</u>	Not Required
	<u>RS</u>	Provided As Re-submission

X Case Narrative

Quality Control Summary Package

<u>X</u>	Data Summary Sheets (Form I)
<u>X</u>	Surrogate Recovery Summary (Form II)
<u>X</u>	Matrix Spoke/Spike Duplicate Recoveries (Form III)
<u>X</u>	Method Blank Summaries (Form IV)
<u>X</u>	GC/MS Tuning and Mass Calibration (Form V)
<u>X</u>	Initial Calibration Data (Form VI)
<u>X</u>	Continuing Calibration Data (Form VII)
<u>X</u>	Internal Standard Area Summary (Form VIII)

Sample and Blank Data Package Section

<u>X</u>	Reconstructed Ion Current (RIC) Chromatogram
<u>X</u>	Quantitation Reports
<u>X</u>	Quantitation Diagnostic Reports
<u>X</u>	Raw and Enhanced Mass Spectra
<u>X</u>	Reference Mass Spectra for Target Compounds
<u>X</u>	EPA/NIH Mass Spectral Library Search for TICs

Raw QC Data Package Section

<u>X</u>	DFTPP and/or BFB mass spectra and mass listings
<u>X</u>	RIC Chromatogram for Standards and MS/MSD Samples
<u>X</u>	Quantitation Reports for Standards and MS/MSD
<u>O</u>	List of Instrument Detection Limits
<u>X</u>	Chain-of-Custody Records
<u>X</u>	Sample Preparation and Analysis Run Logs
<u> </u>	Other (i.e. calculation examples)

I. HOLDING TIMES

Acceptable X Outside QC Limits

Samples were prepared and analyzed within required holding times except as noted under Comments. In addition, no problems were identified with regard to sample preservation or custody unless specified. For those sample fractions prepared or analyzed outside holding time requirements, the results have been qualified as estimated (J).

Water Samples:

VOA - 7 days for analysis
BNA - 7 days for extraction, 40 days for analysis

Soil or Other Matrices:

VOA - 14 days for analysis
BNA - 14 days for extraction, 40 days for analysis

Comments:

No comments.

II. GC/MS TUNING CRITERIA

Acceptable X Outside QC Limits

Unless noted below, GC/MS Tuning Compounds (BFB for VOA; DFTPP for BNA) have been analyzed every 12 hours and met ion abundance requirements. (See SW846 Method 8260 p. 34 for VOA criteria and Method 8270 p. 31 for BNA requirements.)

Comments:

No comments.

III. INITIAL AND CONTINUING CALIBRATIONS

Acceptable _____ Outside QC Limits X

The Relative Response Factor (RRF) data were reviewed for the initial and continuing calibrations. Unless flagged below, a 5-point initial calibration was run, and continuing calibrations were performed at the beginning and at the end of any group of samples and at least every 12 hours. In addition, average RRF, Percent relative Standard Deviation (%RSD) and Percent Difference (%D) values were within control limits (aver. RRF \geq 0.05; %RSD \leq 30; %D \leq 25). or analytes which exceeded these control limits, associated data are qualified as estimated (J). In cases where the low calibration level was not detected, the detection limit is qualified (UJ). In cases where the analyte was not detected in the calibration, all associated data are rejected (R).

Comments:

The following table shows compounds which had %Ds outside QC limits. In the associated soil samples, positive results for these compounds are qualified J.

<i>Compound</i>	<i>%D</i>
Acetone	27.505
2-Butanone	27.087
2-Hexanone	25.563

IV. ERROR DETERMINATION

 X Matrix Spike/Spike Duplicate Samples Analyzed
 No Spike Samples Analyzed

Matrix spike samples are used for a qualitative indication of result bias and precision. Spike recoveries of less than 80% or greater than 120% may be sufficient cause to flag associated data as estimated (J) if the validator believes that the deviation is not due to matrix effects. Recoveries may also be compared with control limits established for the individual compounds (Appendix B).

Comments:

No comments.

V. BLANKS AND BACKGROUND SAMPLES

Acceptable X Detection Limits Adjusted

The following blanks were analyzed:

<u> X </u>	Preparation Blanks	<u> </u>	Field Blanks
<u> </u>	Instrument Blanks	<u> X </u>	Rinsate Blanks
<u> </u>	Background Samples	<u> X </u>	VOA Trip Blanks

Preparation (method) blanks were prepared for each batch of samples extracted. A preparation or instrument blank was analyzed after every continuing calibration standard, prior to sample analysis unless noted below. In addition, instrument blanks were analyzed after high concentration volatiles samples. Any compound detected in the sample and also detected in any associated blank, must be qualified as non-detect (U) when the sample concentration is less than 5x the blank concentration.

Comments:

No comments.

VI. INTERNAL STANDARD AREAS

Acceptable X Outside QC Limits

Internal Standard areas for samples analyzed within a sample group must be within the range of -50% to +100% of the internal standard area for the continuing calibration. If the internal standard area is between 10% and 50% of this value, the associated results are qualified as estimated (J) and the detection limits are qualified as estimated (UJ). If the internal standard area is <10% of the calibration area, both the associated results and detection limits are rejected (R). If the internal standard area is > 100% of the calibration area, the associated results are qualified as estimated (J). For lists of analytes associated with a particular internal standard see SW 846 Method 8260 p.37 for VOA, or Method 8270 p. 33 for BNAs. Internal standards which exceeded these limits are noted below and the associated analytes are qualified on the attached sample report forms.

Comments:

No comments.

VII. SURROGATE RECOVERIES

Acceptable X Outside QC Limits

Surrogate recoveries should be checked against the guidance values listed in SW846 (VOAs: 8260-42, BNAs: 8270-38). List those recoveries which exceed these ranges below. Analytes associated with these surrogates are considered estimated (J).

Comments:

No comments.

VIII. DUPLICATE ANALYSES

Acceptable X Outside QC Limits

Type of duplicates analyzed:

Field Duplicate X

Laboratory Duplicate

Calculate the relative Percent Difference (RPD) between the members of duplicate pairs using the following equation:

$$RPD = \frac{2(\text{Value 1} - \text{Value 2})}{\text{Value 1} + \text{Value 2}} \times 100\%$$

Qualify the results as estimated (J) for any analyte whose RPD exceeds that specified in the Sampling Plan.

Comments:

RPDs are within QC limits. No sampling plan was available.

IX. ANALYTE IDENTIFICATION

Evaluate the ion profiles for the sample analytes and compare them to the library ion profiles provided by the laboratory. Note any identifications which are not sufficiently supported by comparison to known ion profiles.

Comments:

No comments.

X. ANALYTE QUANTITATION/DETECTION LIMITS

Confirm that analyte quantitation was performed correctly using the following formula:

$$\text{sample concentration} = \frac{(\text{analyte area})(\text{concentration of I.S.})}{(\text{area of I.S.})(\text{RRF})}$$

where I.S. is the internal standard.

Calculate the quantitation limit from the concentration of the lowest standard. All results reported below this limit are qualified as presumptively present at an estimated quantity (NJ) and noted on the attached sample data sheets.

Comments:

No comments.

XI. TIC EVALUATION

Evaluate all tentatively identified compounds (TICs). Confirm that TICs are reported only as a class of compounds and that they are qualified as presumptively present at an estimated concentration.

Comments:

No comments.

XII. OVERALL ASSESSMENT OF GENERAL ANALYTICAL DATA

On the basis of this review, the following determination has been made with regard to the overall data usability for the specified level.

Acceptable	_____	Accepted with Qualification	<u>X</u>
Rejected	_____		_____

Accepted data meet the minimum requirements for the following EPA data category:

ERS Screening	_____
Non-definitive with 10% Conformation by Definitive Methodology	_____
Definitive	<u>X</u>
Without Comprehensive Statistical Error Determination	<u>X</u>
With Comprehensive Statistical error Determination	_____

Any qualifications to individual sample analysis results are detailed in the appropriate section above or appear under the comments section below. In cases where several QC criteria are out of specification, it may be appropriate to further qualify the data usability. The data reviewer must use professional judgment and express concerns and comments on the data validity for each specific data package.

Comments:

- *The sample matrix and the types of preservatives used were not reported on the chain-of-custody.*
- *CLP summary sheets were not provided. Therefore, the data was validated based on the raw data package.*
- *Several compounds were qualified J in soil samples due to continuing calibration %RSDs outside QC limits..*

ANALYTICAL DATA REVIEW

APPENDIX A

DATA VALIDATION QUALIFIERS

The following list of data validation qualifiers may be used in this data review package:

- | | |
|------------|--|
| J | The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or because quality control criteria were not met. |
| N | Presumptive evidence of presence of material. |
| NJ | Presumptive evidence of the presence of the material at an estimated quantity. |
| U | The material was analyzed for, but not detected. The associated numerical value is the sample detection limit or adjusted sample detection limit. |
| UJ | The material was analyzed for, but not detected. The reported detection limit is estimated because quality control criteria were not met. |
| R | The sample results are rejected (analyte may or may not be present) due to gross deficiencies in quality control criteria. Any reported value is unusable |
| RND | Recovery Not Determined (Optional). |
| PND | Precision Not Determined (Optional). |

ANNOTATED DATA SUMMARY SHEETS

Hand-annotated copies of the Data Summary Sheets from the analytical data package follow. When appropriate, detection limits have been adjusted to reflect effects of relevant qualifications noted during the data review. Errors in the reporting of detected compound results will usually not be changed by hand. In these cases, the laboratory may be required to re-submit portions of the data package and any affected Data summary Sheets. Any additional quality control failures have been flagged using the above listed data validation qualifiers.

Pages of Annotated Data summary Sheets follow.

SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-4A
Lab ID:	71868-01
Date Received:	4/8/98
Date Prepared:	4/10/98
Date Analyzed:	4/10/98
% Solids	83.54
Dilution Factor	1

Volatile Organics by USEPA Method 5035/8260B Modified

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Dibromofluoromethane	118		75	154
Toluene-d8	103		65	141
Bromofluorobenzene	105		82	157

Sample results are on a dry weight basis.

Analyte	Result (ug/kg)	PQL	MDL	Flags
Dichlorodifluoromethane	ND	11	1.12	
Chloromethane	ND	11	4.39	
Vinyl Chloride	ND	11	1.29	
Bromomethane	ND	11	1.68	
Chloroethane	ND	11	4.43	
Trichlorofluoromethane	ND	11	1.68	
1,1-Dichloroethene	ND	11	2.42	
1,1,2-Trichlorotrifluoroethane	ND	11	1.98	
Acetone	21	11	3.73	J
Methylene Chloride	3.5	11	1.83	J
trans-1,2-Dichloroethene	ND	11	2.05	
1,1-Dichloroethane	ND	11	1.27	
2,2-Dichloropropane	ND	11	1.09	
cis-1,2-Dichloroethene	ND	11	1.55	
2-Butanone	ND	11	3.97	
Bromochloromethane	ND	11	4.07	
Chloroform	ND	11	3.64	
1,1,1-Trichloroethane	ND	11	2.87	
Carbon Tetrachloride	ND	11	1.92	
1,1-Dichloropropene	ND	11	2.15	
Benzene	ND	11	1.83	
1,2-Dichloroethane	ND	11	1.82	
Trichloroethene	ND	11	2.42	
1,2-Dichloropropane	ND	11	1.78	
Dibromomethane	ND	11	2.03	
Bromodichloromethane	ND	11	1.96	

5/12/98
JW

SOUND ANALYTICAL SERVICES, INC.

Volatile Organics by USEPA Method 5035/8260B Modified data for 71868-01 continued...

Analyte	Result (ug/kg)	PQL	MDL	
cis-1,3-Dichloropropene	ND	11	1.82	
Toluene	19	11	2.2	
4-Methyl-2-pentanone	ND	11	3.39	
trans-1,3-Dichloropropene	ND	11	1.41	
1,1,2-Trichloroethane	ND	11	1.76	
Tetrachloroethene	ND	11	2.1	
1,3-Dichloropropane	ND	11	1.76	
Dibromochloromethane	ND	11	1.55	
1,2-Dibromoethane	ND	11	1.66	
2-Hexanone	ND	11	1.74	
Chlorobenzene	ND	11	1.94	
1,1,1,2-Tetrachloroethane	ND	11	1.66	
Ethylbenzene	4.6	11	1.83	J
m,p-Xylene	19	22	3.65	J
o-Xylene	3	11	1.82	J
Styrene	ND	11	1.68	
Bromoform	ND	11	1.65	
Isopropylbenzene	2.5	11	1.9	J
Bromobenzene	ND	11	1.65	
1,1,2,2-Tetrachloroethane	ND	11	2.16	
1,2,3-Trichloropropane	ND	11	2.45	
n-Propylbenzene	5.8	11	1.99	J
2-Chlorotoluene	ND	11	1.96	
4-Chlorotoluene	ND	11	2.04	
1,3,5-Trimethylbenzene	3.5	11	1.95	J
t-Butylbenzene	3.8	11	2.04	J
1,2,4-Trimethylbenzene	7.7	11	2.15	J
sec-Butylbenzene	7.3	11	2.15	J
1,3-Dichlorobenzene	ND	11	1.93	
1,4-Dichlorobenzene	ND	11	2.26	
4-Isopropyltoluene	7.6	11	2.16	J
1,2-Dichlorobenzene	ND	11	1.78	
n-Butylbenzene	5.1	11	2.31	J
1,2-Dibromo-3-chloropropane	ND	11	2.17	
1,2,4-Trichlorobenzene	2.4	11	2.08	J
Hexachlorobutadiene	ND	11	2.8	
Naphthalene	19	11	2.06	
1,2,3-Trichlorobenzene	ND	11	2.32	

5/18/98 

SOUND ANALYTICAL SERVICES, INC.


Client Name	Ecology & Environment, Inc.
Client ID:	ST-4B
Lab ID:	71868-02
Date Received:	4/8/98
Date Prepared:	4/10/98
Date Analyzed:	4/10/98
% Solids	79.84
Dilution Factor	1

Volatile Organics by USEPA Method 5035/8260B Modified

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Dibromofluoromethane	111		75	154
Toluene-d8	100		65	141
Bromofluorobenzene	104		82	157

Sample results are on a dry weight basis.

Analyte	Result (ug/kg)	PQL	MDL	Flags
Dichlorodifluoromethane	ND	12	1.12	
Chloromethane	ND	12	4.39	
Vinyl Chloride	ND	12	1.29	
Bromomethane	ND	12	1.68	
Chloroethane	ND	12	4.43	
Trichlorofluoromethane	ND	12	1.68	
1,1-Dichloroethene	ND	12	2.42	
1,1,2-Trichlorotrifluoroethane	ND	12	1.98	
Acetone	ND	12	3.73	
Methylene Chloride	ND	12	1.83	
trans-1,2-Dichloroethene	ND	12	2.05	
1,1-Dichloroethane	ND	12	1.27	
2,2-Dichloropropane	ND	12	1.09	
cis-1,2-Dichloroethene	ND	12	1.55	
2-Butanone	ND	12	3.97	
Bromochloromethane	ND	12	4.07	
Chloroform	ND	12	3.64	
1,1,1-Trichloroethane	ND	12	2.87	
Carbon Tetrachloride	ND	12	1.92	
1,1-Dichloropropene	ND	12	2.15	
Benzene	ND	12	1.83	
1,2-Dichloroethane	ND	12	1.82	
Trichloroethene	6.6	12	2.42	
1,2-Dichloropropane	ND	12	1.78	
Dibromomethane	ND	12	2.03	
Bromodichloromethane	ND	12	1.96	

J
5/18/98


SOUND ANALYTICAL SERVICES, INC.

Volatile Organics by USEPA Method 5035/8260B Modified data for 71868-02 continued...

Analyte	Result (ug/kg)	PQL	MDL	
cis-1,3-Dichloropropene	ND	12	1.82	
Toluene	4.1	12	2.2	J
4-Methyl-2-pentanone	ND	12	3.39	
trans-1,3-Dichloropropene	ND	12	1.41	
1,1,2-Trichloroethane	ND	12	1.76	
Tetrachloroethene	4.5	12	2.1	J
1,3-Dichloropropane	ND	12	1.76	
Dibromochloromethane	ND	12	1.55	
1,2-Dibromoethane	ND	12	1.66	
2-Hexanone	ND	12	1.74	
Chlorobenzene	ND	12	1.94	
1,1,1,2-Tetrachloroethane	ND	12	1.66	
Ethylbenzene	ND	12	1.83	
m,p-Xylene	ND	23	3.65	
o-Xylene	ND	12	1.82	
Styrene	ND	12	1.68	
Bromoform	ND	12	1.65	
Isopropylbenzene	ND	12	1.9	
Bromobenzene	ND	12	1.65	
1,1,2,2-Tetrachloroethane	ND	12	2.16	
1,2,3-Trichloropropane	ND	12	2.45	
n-Propylbenzene	ND	12	1.99	
2-Chlorotoluene	ND	12	1.96	
4-Chlorotoluene	ND	12	2.04	
1,3,5-Trimethylbenzene	ND	12	1.95	
t-Butylbenzene	ND	12	2.04	
1,2,4-Trimethylbenzene	ND	12	2.15	
sec-Butylbenzene	ND	12	2.15	
1,3-Dichlorobenzene	ND	12	1.93	
1,4-Dichlorobenzene	ND	12	2.26	
4-Isopropyltoluene	ND	12	2.16	
1,2-Dichlorobenzene	ND	12	1.78	
n-Butylbenzene	ND	12	2.31	
1,2-Dibromo-3-chloropropane	ND	12	2.17	
1,2,4-Trichlorobenzene	ND	12	2.08	
Hexachlorobutadiene	ND	12	2.8	
Naphthalene	3.9	12	2.06	J
1,2,3-Trichlorobenzene	ND	12	2.32	

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SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-5
Lab ID:	71868-03
Date Received:	4/8/98
Date Prepared:	4/10/98
Date Analyzed:	4/10/98
% Solids	76.18
Dilution Factor	1

Volatile Organics by USEPA Method 5035/8260B Modified

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Dibromofluoromethane	108		75	154
Toluene-d8	102		65	141
Bromofluorobenzene	107		82	157

Sample results are on a dry weight basis.

Analyte	Result (ug/kg)	PQL	MDL	Flags
Dichlorodifluoromethane	ND	12	1.12	
Chloromethane	ND	12	4.39	
Vinyl Chloride	ND	12	1.29	
Bromomethane	ND	12	1.68	
Chloroethane	ND	12	4.43	
Trichlorofluoromethane	ND	12	1.68	
1,1-Dichloroethene	ND	12	2.42	
1,1,2-Trichlorotrifluoroethane	ND	12	1.98	
Acetone	20	12	3.73	
Methylene Chloride	4.5	12	1.83	
trans-1,2-Dichloroethene	ND	12	2.05	
1,1-Dichloroethane	ND	12	1.27	
2,2-Dichloropropane	ND	12	1.09	
cis-1,2-Dichloroethene	ND	12	1.55	
2-Butanone	ND	12	3.97	
Bromochloromethane	ND	12	4.07	
Chloroform	ND	12	3.64	
1,1,1-Trichloroethane	ND	12	2.87	
Carbon Tetrachloride	ND	12	1.92	
1,1-Dichloropropene	ND	12	2.15	
Benzene	ND	12	1.83	
1,2-Dichloroethane	ND	12	1.82	
Trichloroethene	ND	12	2.42	
1,2-Dichloropropane	ND	12	1.78	
Dibromomethane	ND	12	2.03	
Bromodichloromethane	ND	12	1.96	

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SOUND ANALYTICAL SERVICES, INC.

Volatile Organics by USEPA Method 5035/8260B Modified data for 71868-03 continued...

Analyte	Result (ug/kg)	PQL	MDL	
cis-1,3-Dichloropropene	ND	12	1.82	
Toluene	5.8	12	2.2	J
4-Methyl-2-pentanone	ND	12	3.39	
trans-1,3-Dichloropropene	ND	12	1.41	
1,1,2-Trichloroethane	ND	12	1.76	
Tetrachloroethene	ND	12	2.1	
1,3-Dichloropropane	ND	12	1.76	
Dibromochloromethane	ND	12	1.55	
1,2-Dibromoethane	ND	12	1.66	
2-Hexanone	ND	12	1.74	
Chlorobenzene	ND	12	1.94	
1,1,1,2-Tetrachloroethane	ND	12	1.66	
Ethylbenzene	ND	12	1.83	
m,p-Xylene	ND	24	3.65	
o-Xylene	ND	12	1.82	
Styrene	ND	12	1.68	
Bromoform	ND	12	1.65	
Isopropylbenzene	ND	12	1.9	
Bromobenzene	ND	12	1.65	
1,1,2,2-Tetrachloroethane	ND	12	2.16	
1,2,3-Trichloropropane	ND	12	2.45	
n-Propylbenzene	ND	12	1.99	
2-Chlorotoluene	ND	12	1.96	
4-Chlorotoluene	ND	12	2.04	
1,3,5-Trimethylbenzene	ND	12	1.95	
t-Butylbenzene	ND	12	2.04	
1,2,4-Trimethylbenzene	4.7	12	2.15	J
sec-Butylbenzene	ND	12	2.15	
1,3-Dichlorobenzene	ND	12	1.93	
1,4-Dichlorobenzene	ND	12	2.26	
4-Isopropyltoluene	ND	12	2.16	
1,2-Dichlorobenzene	ND	12	1.78	
n-Butylbenzene	5	12	2.31	J
1,2-Dibromo-3-chloropropane	ND	12	2.17	
1,2,4-Trichlorobenzene	ND	12	2.08	
Hexachlorobutadiene	ND	12	2.8	
Naphthalene	2	12	2.06	J
1,2,3-Trichlorobenzene	ND	12	2.32	

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SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	DW-1
Lab ID:	71868-04
Date Received:	4/8/98
Date Prepared:	4/10/98
Date Analyzed:	4/10/98
% Solids	78.68
Dilution Factor	1

Volatile Organics by USEPA Method 5035/8260B Modified

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Dibromofluoromethane	109		75	154
Toluene-d8	98		65	141
Bromofluorobenzene	95		82	157

Sample results are on a dry weight basis.


Analyte	Result (ug/kg)	PQL	MDL	Flags
Dichlorodifluoromethane	ND	11	1.12	
Chloromethane	ND	11	4.39	
Vinyl Chloride	ND	11	1.29	
Bromomethane	ND	11	1.68	
Chloroethane	ND	11	4.43	
Trichlorofluoromethane	ND	11	1.68	
1,1-Dichloroethene	ND	11	2.42	
1,1,2-Trichlorotrifluoroethane	ND	11	1.98	
Acetone	ND	11	3.73	
Methylene Chloride	3.6	11	1.83	J
trans-1,2-Dichloroethene	ND	11	2.05	
1,1-Dichloroethane	ND	11	1.27	
2,2-Dichloropropane	ND	11	1.09	
cis-1,2-Dichloroethene	ND	11	1.55	
2-Butanone	ND	11	3.97	
Bromochloromethane	ND	11	4.07	
Chloroform	ND	11	3.64	
1,1,1-Trichloroethane	ND	11	2.87	
Carbon Tetrachloride	ND	11	1.92	
1,1-Dichloropropene	ND	11	2.15	
Benzene	ND	11	1.83	
1,2-Dichloroethane	ND	11	1.82	
Trichloroethene	ND	11	2.42	
1,2-Dichloropropane	ND	11	1.78	
Dibromomethane	ND	11	2.03	
Bromodichloromethane	ND	11	1.96	

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SOUND ANALYTICAL SERVICES, INC.

Volatile Organics by USEPA Method 5035/8260B Modified data for 71868-04 continued...

Analyte	Result (ug/kg)	PQL	MDL	
cis-1,3-Dichloropropene	ND	11	1.82	
Toluene	4.3	11	2.2	J
4-Methyl-2-pentanone	ND	11	3.39	
trans-1,3-Dichloropropene	ND	11	1.41	
1,1,2-Trichloroethane	ND	11	1.76	
Tetrachloroethene	5.2	11	2.1	J
1,3-Dichloropropane	ND	11	1.76	
Dibromochloromethane	ND	11	1.55	
1,2-Dibromoethane	ND	11	1.66	
2-Hexanone	ND	11	1.74	
Chlorobenzene	ND	11	1.94	
1,1,1,2-Tetrachloroethane	ND	11	1.66	
Ethylbenzene	ND	11	1.83	
m,p-Xylene	ND	22	3.65	
o-Xylene	ND	11	1.82	
Styrene	ND	11	1.68	
Bromoform	ND	11	1.65	
Isopropylbenzene	ND	11	1.9	
Bromobenzene	ND	11	1.65	
1,1,2,2-Tetrachloroethane	ND	11	2.16	
1,2,3-Trichloropropane	ND	11	2.45	
n-Propylbenzene	ND	11	1.99	
2-Chlorotoluene	ND	11	1.96	
4-Chlorotoluene	ND	11	2.04	
1,3,5-Trimethylbenzene	ND	11	1.95	
t-Butylbenzene	ND	11	2.04	
1,2,4-Trimethylbenzene	ND	11	2.15	
sec-Butylbenzene	ND	11	2.15	
1,3-Dichlorobenzene	ND	11	1.93	
1,4-Dichlorobenzene	ND	11	2.26	
4-Isopropyltoluene	ND	11	2.16	
1,2-Dichlorobenzene	ND	11	1.78	
n-Butylbenzene	ND	11	2.31	
1,2-Dibromo-3-chloropropane	ND	11	2.17	
1,2,4-Trichlorobenzene	ND	11	2.08	
Hexachlorobutadiene	ND	11	2.8	
Naphthalene	ND	11	2.06	
1,2,3-Trichlorobenzene	ND	11	2.32	

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SOUND ANALYTICAL SERVICES, INC.


Client Name	Ecology & Environment, Inc.
Client ID:	BKG-1
Lab ID:	71868-05
Date Received:	4/8/98
Date Prepared:	4/10/98
Date Analyzed:	4/10/98
% Solids	86.3
Dilution Factor	1

Volatile Organics by USEPA Method 5035/8260B Modified

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Dibromofluoromethane	111		75	154
Toluene-d8	97		65	141
Bromofluorobenzene	94		82	157

Sample results are on a dry weight basis.

Analyte	Result (ug/kg)	PQL	MDL	Flags
Dichlorodifluoromethane	ND	11	1.12	
Chloromethane	ND	11	4.39	
Vinyl Chloride	ND	11	1.29	
Bromomethane	ND	11	1.68	
Chloroethane	ND	11	4.43	
Trichlorofluoromethane	ND	11	1.68	
1,1-Dichloroethene	ND	11	2.42	
1,1,2-Trichlorotrifluoroethane	ND	11	1.98	
Acetone	ND	11	3.73	
Methylene Chloride	3.1	11	1.83	J
trans-1,2-Dichloroethene	ND	11	2.05	
1,1-Dichloroethane	ND	11	1.27	
2,2-Dichloropropane	ND	11	1.09	
cis-1,2-Dichloroethene	ND	11	1.55	
2-Butanone	ND	11	3.97	
Bromochloromethane	ND	11	4.07	
Chloroform	ND	11	3.64	
1,1,1-Trichloroethane	ND	11	2.87	
Carbon Tetrachloride	ND	11	1.92	
1,1-Dichloropropene	ND	11	2.15	
Benzene	ND	11	1.83	
1,2-Dichloroethane	ND	11	1.82	
Trichloroethene	ND	11	2.42	
1,2-Dichloropropane	ND	11	1.78	
Dibromomethane	ND	11	2.03	
Bromodichloromethane	ND	11	1.96	


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SOUND ANALYTICAL SERVICES, INC.

Volatile Organics by USEPA Method 5035/8260B Modified data for 71868-05 continued...

Analyte	Result (ug/kg)	PQL	MDL
cis-1,3-Dichloropropene	ND	11	1.82
Toluene	3.7	11	2.2
4-Methyl-2-pentanone	ND	11	3.39
trans-1,3-Dichloropropene	ND	11	1.41
1,1,2-Trichloroethane	ND	11	1.76
Tetrachloroethene	ND	11	2.1
1,3-Dichloropropane	ND	11	1.76
Dibromochloromethane	ND	11	1.55
1,2-Dibromoethane	ND	11	1.66
2-Hexanone	ND	11	1.74
Chlorobenzene	ND	11	1.94
1,1,1,2-Tetrachloroethane	ND	11	1.66
Ethylbenzene	ND	11	1.83
m,p-Xylene	ND	22	3.65
o-Xylene	ND	11	1.82
Styrene	ND	11	1.68
Bromoform	ND	11	1.65
Isopropylbenzene	ND	11	1.9
Bromobenzene	ND	11	1.65
1,1,2,2-Tetrachloroethane	ND	11	2.16
1,2,3-Trichloropropane	ND	11	2.45
n-Propylbenzene	ND	11	1.99
2-Chlorotoluene	ND	11	1.96
4-Chlorotoluene	ND	11	2.04
1,3,5-Trimethylbenzene	ND	11	1.95
t-Butylbenzene	ND	11	2.04
1,2,4-Trimethylbenzene	ND	11	2.15
sec-Butylbenzene	ND	11	2.15
1,3-Dichlorobenzene	ND	11	1.93
1,4-Dichlorobenzene	ND	11	2.26
4-Isopropyltoluene	ND	11	2.16
1,2-Dichlorobenzene	ND	11	1.78
n-Butylbenzene	ND	11	2.31
1,2-Dibromo-3-chloropropane	ND	11	2.17
1,2,4-Trichlorobenzene	ND	11	2.08
Hexachlorobutadiene	ND	11	2.8
Naphthalene	ND	11	2.06
1,2,3-Trichlorobenzene	ND	11	2.32

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SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-3D
Lab ID:	71868-08
Date Received:	4/8/98
Date Prepared:	4/10/98
Date Analyzed:	4/10/98
% Solids	-
Dilution Factor	1

Volatile Organics by USEPA Method 5030/8260

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Dibromofluoromethane	105		77	116
Toluene-D8	98		91	107
Bromofluorobenzene	96		92	109

Analyte	Result (ug/L)	PQL	MDL	Flags
Dichlorodifluoromethane	ND	0.4	0.04	
Chloromethane	ND	0.4	0.07	
Vinyl Chloride	ND	0.4	0.02	
Bromomethane	ND	0.4	0.18	
Chloroethane	ND	0.4	0.03	
Trichlorofluoromethane	ND	0.4	0.02	
1,1-Dichloroethene	ND	0.4	0.02	
Methylene Chloride	ND	0.4	0.02	
trans-1,2-Dichloroethene	ND	0.4	0.02	
1,1-Dichloroethane	ND	0.4	0.03	
2,2-Dichloropropane	ND	0.4	0.1	
cis-1,2-Dichloroethene	ND	0.4	0.02	
Bromochloromethane	ND	0.4	0.02	
Chloroform	ND	0.4	0.02	
1,1,1-Trichloroethane	ND	0.4	0.03	
Carbon tetrachloride	ND	0.4	0.04	
1,1-Dichloropropene	ND	0.4	0.07	
Benzene	ND	0.4	0.09	
1,2-Dichloroethane	ND	0.4	0.02	
Trichloroethene	ND	0.4	0.02	
1,2-Dichloropropane	ND	0.4	0.02	
Dibromomethane	ND	0.4	0.02	
Bromodichloromethane	ND	0.4	0.02	
cis-1,3-Dichloropropene	ND	0.4	0.03	
Toluene	ND	0.4	0.03	
trans-1,3-Dichloropropene	ND	0.4	0.04	

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SOUND ANALYTICAL SERVICES, INC.

Volatile Organics by USEPA Method 5030/8260 data for 71868-08 continued...

Analyte	Result (ug/L)	PQL	MDL
1,1,2-Trichloroethane	ND	0.4	0.02
Tetrachloroethene	ND	0.4	0.02
1,3-Dichloropropane	ND	0.4	0.03
Dibromochloromethane	ND	0.4	0.02
1,2-Dibromoethane	ND	0.4	0.02
Chlorobenzene	6.6	0.4	0.03
1,1,1,2-Tetrachloroethane	ND	0.4	0.03
Ethylbenzene	0.52	0.4	0.03
m,p-Xylene	ND	0.8	0.05
o-Xylene	ND	0.4	0.03
Styrene	ND	0.4	0.03
Bromoform	ND	0.4	0.02
Isopropylbenzene	ND	0.4	0.03
Bromobenzene	ND	0.4	0.03
1,1,2,2-Tetrachloroethane	ND	0.4	0.03
1,2,3-Trichloropropane	ND	0.4	0.04
n-Propylbenzene	ND	0.4	0.03
2-Chlorotoluene	ND	0.4	0.03
1,3,5-Trimethylbenzene	ND	0.4	0.03
4-Chlorotoluene	ND	0.4	0.03
t-Butylbenzene	ND	0.4	0.03
1,2,4-Trimethylbenzene	ND	0.4	0.03
sec-Butylbenzene	ND	0.4	0.02
1,3-Dichlorobenzene	ND	0.4	0.04
4-Isopropyltoluene	ND	0.4	0.03
1,4-Dichlorobenzene	ND	0.4	0.03
1,2-Dichlorobenzene	ND	0.4	0.03
n-Butylbenzene	ND	0.4	0.03
1,2-Dibromo-3-chloropropane	ND	0.4	0.04
1,2,4-Trichlorobenzene	ND	0.4	0.04
Hexachlorobutadiene	ND	0.4	0.09
Naphthalene	0.69	0.4	0.03
1,2,3-Trichlorobenzene	ND	0.4	0.02

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SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-3E
Lab ID:	71868-11
Date Received:	4/8/98
Date Prepared:	4/10/98
Date Analyzed:	4/10/98
% Solids	-
Dilution Factor	1

Volatile Organics by USEPA Method 5030/8260

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Dibromofluoromethane	101		77	116
Toluene-D8	98		91	107
Bromofluorobenzene	102		92	109

Analyte	Result (ug/L)	PQL	MDL	Flags
Dichlorodifluoromethane	ND	0.4	0.04	
Chloromethane	ND	0.4	0.07	
Vinyl Chloride	ND	0.4	0.02	
Bromomethane	ND	0.4	0.18	
Chloroethane	ND	0.4	0.03	
Trichlorofluoromethane	ND	0.4	0.02	
1,1-Dichloroethene	ND	0.4	0.02	
Methylene Chloride	ND	0.4	0.02	
trans-1,2-Dichloroethene	ND	0.4	0.02	
1,1-Dichloroethane	ND	0.4	0.03	
2,2-Dichloropropane	ND	0.4	0.1	
cis-1,2-Dichloroethene	ND	0.4	0.02	
Bromochloromethane	ND	0.4	0.02	
Chloroform	ND	0.4	0.02	
1,1,1-Trichloroethane	ND	0.4	0.03	
Carbon tetrachloride	ND	0.4	0.04	
1,1-Dichloropropene	ND	0.4	0.07	
Benzene	ND	0.4	0.09	
1,2-Dichloroethane	ND	0.4	0.02	
Trichloroethene	ND	0.4	0.02	
1,2-Dichloropropane	ND	0.4	0.02	
Dibromomethane	ND	0.4	0.02	
Bromodichloromethane	ND	0.4	0.02	
cis-1,3-Dichloropropene	ND	0.4	0.03	
Toluene	ND	0.4	0.03	
trans-1,3-Dichloropropene	ND	0.4	0.04	

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SOUND ANALYTICAL SERVICES, INC.

Volatile Organics by USEPA Method 5030/8260 data for 71868-11 continued...

Analyte	Result (ug/L)	PQL	MDL
1,1,2-Trichloroethane	ND	0.4	0.02
Tetrachloroethene	ND	0.4	0.02
1,3-Dichloropropane	ND	0.4	0.03
Dibromochloromethane	ND	0.4	0.02
1,2-Dibromoethane	ND	0.4	0.02
Chlorobenzene	0.89	0.4	0.03
1,1,1,2-Tetrachloroethane	ND	0.4	0.03
Ethylbenzene	ND	0.4	0.03
m,p-Xylene	ND	0.8	0.05
o-Xylene	ND	0.4	0.03
Styrene	ND	0.4	0.03
Bromoform	ND	0.4	0.02
Isopropylbenzene	ND	0.4	0.03
Bromobenzene	ND	0.4	0.03
1,1,2,2-Tetrachloroethane	ND	0.4	0.03
1,2,3-Trichloropropane	ND	0.4	0.04
n-Propylbenzene	ND	0.4	0.03
2-Chlorotoluene	ND	0.4	0.03
1,3,5-Trimethylbenzene	ND	0.4	0.03
4-Chlorotoluene	ND	0.4	0.03
t-Butylbenzene	ND	0.4	0.03
1,2,4-Trimethylbenzene	ND	0.4	0.03
sec-Butylbenzene	ND	0.4	0.02
1,3-Dichlorobenzene	ND	0.4	0.04
4-Isopropyltoluene	ND	0.4	0.03
1,4-Dichlorobenzene	ND	0.4	0.03
1,2-Dichlorobenzene	ND	0.4	0.03
n-Butylbenzene	ND	0.4	0.03
1,2-Dibromo-3-chloropropane	ND	0.4	0.04
1,2,4-Trichlorobenzene	ND	0.4	0.04
Hexachlorobutadiene	ND	0.4	0.09
Naphthalene	ND	0.4	0.03
1,2,3-Trichlorobenzene	ND	0.4	0.02

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SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	UST-1
Lab ID:	71868-14
Date Received:	4/8/98
Date Prepared:	4/10/98
Date Analyzed:	4/10/98
% Solids	-
Dilution Factor	1

Volatile Organics by USEPA Method 5030/8260

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Dibromofluoromethane	102		77	116
Toluene-D8	100		91	107
Bromofluorobenzene	101		92	109

Analyte	Result (ug/L)	PQL	MDL	Flags
Dichlorodifluoromethane	ND	0.4	0.04	
Chloromethane	ND	0.4	0.07	
Vinyl Chloride	ND	0.4	0.02	
Bromomethane	ND	0.4	0.18	
Chloroethane	ND	0.4	0.03	
Trichlorofluoromethane	ND	0.4	0.02	
1,1-Dichloroethene	ND	0.4	0.02	
Methylene Chloride	ND	0.4	0.02	
trans-1,2-Dichloroethene	ND	0.4	0.02	
1,1-Dichloroethane	ND	0.4	0.03	
2,2-Dichloropropane	ND	0.4	0.1	
cis-1,2-Dichloroethene	1.3	0.4	0.02	
Bromochloromethane	ND	0.4	0.02	
Chloroform	ND	0.4	0.02	
1,1,1-Trichloroethane	ND	0.4	0.03	
Carbon tetrachloride	ND	0.4	0.04	
1,1-Dichloropropene	ND	0.4	0.07	
Benzene	ND	0.4	0.09	
1,2-Dichloroethane	ND	0.4	0.02	
Trichloroethene	ND	0.4	0.02	
1,2-Dichloropropane	ND	0.4	0.02	
Dibromomethane	ND	0.4	0.02	
Bromodichloromethane	ND	0.4	0.02	
cis-1,3-Dichloropropene	ND	0.4	0.03	
Toluene	ND	0.4	0.03	
trans-1,3-Dichloropropene	ND	0.4	0.04	

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SOUND ANALYTICAL SERVICES, INC.

Volatile Organics by USEPA Method 5030/8260 data for 71868-14 continued...

Analyte	Result (ug/L)	PQL	MDL
1,1,2-Trichloroethane	ND	0.4	0.02
Tetrachloroethene	ND	0.4	0.02
1,3-Dichloropropane	ND	0.4	0.03
Dibromochloromethane	ND	0.4	0.02
1,2-Dibromoethane	ND	0.4	0.02
Chlorobenzene	ND	0.4	0.03
1,1,1,2-Tetrachloroethane	ND	0.4	0.03
Ethylbenzene	ND	0.4	0.03
m,p-Xylene	ND	0.8	0.05
o-Xylene	ND	0.4	0.03
Styrene	ND	0.4	0.03
Bromoform	ND	0.4	0.02
Isopropylbenzene	ND	0.4	0.03
Bromobenzene	ND	0.4	0.03
1,1,2,2-Tetrachloroethane	ND	0.4	0.03
1,2,3-Trichloropropane	ND	0.4	0.04
n-Propylbenzene	ND	0.4	0.03
2-Chlorotoluene	ND	0.4	0.03
1,3,5-Trimethylbenzene	ND	0.4	0.03
4-Chlorotoluene	ND	0.4	0.03
t-Butylbenzene	ND	0.4	0.03
1,2,4-Trimethylbenzene	ND	0.4	0.03
sec-Butylbenzene	ND	0.4	0.02
1,3-Dichlorobenzene	ND	0.4	0.04
4-Isopropyltoluene	ND	0.4	0.03
1,4-Dichlorobenzene	ND	0.4	0.03
1,2-Dichlorobenzene	ND	0.4	0.03
n-Butylbenzene	ND	0.4	0.03
1,2-Dibromo-3-chloropropane	ND	0.4	0.04
1,2,4-Trichlorobenzene	ND	0.4	0.04
Hexachlorobutadiene	ND	0.4	0.09
Naphthalene	ND	0.4	0.03
1,2,3-Trichlorobenzene	ND	0.4	0.02

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SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	TB-2-4/6/98
Lab ID:	71868-15
Date Received:	4/8/98
Date Prepared:	4/10/98
Date Analyzed:	4/10/98
% Solids	-
Dilution Factor	1

Volatile Organics by USEPA Method 5030/8260

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Dibromofluoromethane	103		77	116
Toluene-D8	99		91	107
Bromofluorobenzene	100		92	109

Analyte	Result (ug/L)	PQL	MDL	Flags
Dichlorodifluoromethane	ND	0.4	0.04	
Chloromethane	ND	0.4	0.07	
Vinyl Chloride	ND	0.4	0.02	
Bromomethane	ND	0.4	0.18	
Chloroethane	ND	0.4	0.03	
Trichlorofluoromethane	ND	0.4	0.02	
1,1-Dichloroethene	ND	0.4	0.02	
Methylene Chloride	ND	0.4	0.02	
trans-1,2-Dichloroethene	ND	0.4	0.02	
1,1-Dichloroethane	ND	0.4	0.03	
2,2-Dichloropropane	ND	0.4	0.1	
cis-1,2-Dichloroethene	ND	0.4	0.02	
Bromochloromethane	ND	0.4	0.02	
Chloroform	ND	0.4	0.02	
1,1,1-Trichloroethane	ND	0.4	0.03	
Carbon tetrachloride	ND	0.4	0.04	
1,1-Dichloropropene	ND	0.4	0.07	
Benzene	ND	0.4	0.09	
1,2-Dichloroethane	ND	0.4	0.02	
Trichloroethene	ND	0.4	0.02	
1,2-Dichloropropane	ND	0.4	0.02	
Dibromomethane	ND	0.4	0.02	
Bromodichloromethane	ND	0.4	0.02	
cis-1,3-Dichloropropene	ND	0.4	0.03	
Toluene	ND	0.4	0.03	
trans-1,3-Dichloropropene	ND	0.4	0.04	

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SOUND ANALYTICAL SERVICES, INC.

Volatile Organics by USEPA Method 5030/8260 data for 71868-15 continued...

Analyte	Result (ug/L)	PQL	MDL
1,1,2-Trichloroethane	ND	0.4	0.02
Tetrachloroethene	ND	0.4	0.02
1,3-Dichloropropane	ND	0.4	0.03
Dibromochloromethane	ND	0.4	0.02
1,2-Dibromoethane	ND	0.4	0.02
Chlorobenzene	ND	0.4	0.03
1,1,1,2-Tetrachloroethane	ND	0.4	0.03
Ethylbenzene	ND	0.4	0.03
m,p-Xylene	ND	0.8	0.05
o-Xylene	ND	0.4	0.03
Styrene	ND	0.4	0.03
Bromoform	ND	0.4	0.02
Isopropylbenzene	ND	0.4	0.03
Bromobenzene	ND	0.4	0.03
1,1,2,2-Tetrachloroethane	ND	0.4	0.03
1,2,3-Trichloropropane	ND	0.4	0.04
n-Propylbenzene	ND	0.4	0.03
2-Chlorotoluene	ND	0.4	0.03
1,3,5-Trimethylbenzene	ND	0.4	0.03
4-Chlorotoluene	ND	0.4	0.03
t-Butylbenzene	ND	0.4	0.03
1,2,4-Trimethylbenzene	ND	0.4	0.03
sec-Butylbenzene	ND	0.4	0.02
1,3-Dichlorobenzene	ND	0.4	0.04
4-Isopropyltoluene	ND	0.4	0.03
1,4-Dichlorobenzene	ND	0.4	0.03
1,2-Dichlorobenzene	ND	0.4	0.03
n-Butylbenzene	ND	0.4	0.03
1,2-Dibromo-3-chloropropane	ND	0.4	0.04
1,2,4-Trichlorobenzene	ND	0.4	0.04
Hexachlorobutadiene	ND	0.4	0.09
Naphthalene	ND	0.4	0.03
1,2,3-Trichlorobenzene	ND	0.4	0.02

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SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	EB-1
Lab ID:	71868-18
Date Received:	4/8/98
Date Prepared:	4/10/98
Date Analyzed:	4/10/98
% Solids	-
Dilution Factor	1

Volatile Organics by USEPA Method 5030/8260

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Dibromofluoromethane	104		77	116
Toluene-D8	101		91	107
Bromofluorobenzene	102		92	109

Analyte	Result (ug/L)	PQL	MDL	Flags
Dichlorodifluoromethane	ND	0.4	0.04	
Chloromethane	ND	0.4	0.07	
Vinyl Chloride	ND	0.4	0.02	
Bromomethane	ND	0.4	0.18	
Chloroethane	ND	0.4	0.03	
Trichlorofluoromethane	ND	0.4	0.02	
1,1-Dichloroethene	ND	0.4	0.02	
Methylene Chloride	ND	0.4	0.02	
trans-1,2-Dichloroethene	ND	0.4	0.02	
1,1-Dichloroethane	ND	0.4	0.03	
2,2-Dichloropropane	ND	0.4	0.1	
cis-1,2-Dichloroethene	ND	0.4	0.02	
Bromochloromethane	ND	0.4	0.02	
Chloroform	ND	0.4	0.02	
1,1,1-Trichloroethane	ND	0.4	0.03	
Carbon tetrachloride	ND	0.4	0.04	
1,1-Dichloropropene	ND	0.4	0.07	
Benzene	ND	0.4	0.09	
1,2-Dichloroethane	ND	0.4	0.02	
Trichloroethene	ND	0.4	0.02	
1,2-Dichloropropane	ND	0.4	0.02	
Dibromomethane	ND	0.4	0.02	
Bromodichloromethane	ND	0.4	0.02	
cis-1,3-Dichloropropene	ND	0.4	0.03	
Toluene	ND	0.4	0.03	
trans-1,3-Dichloropropene	ND	0.4	0.04	

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SOUND ANALYTICAL SERVICES, INC.

Volatile Organics by USEPA Method 5030/8260 data for 71868-18 continued...

Analyte	Result (ug/L)	PQL	MDL
1,1,2-Trichloroethane	ND	0.4	0.02
Tetrachloroethene	ND	0.4	0.02
1,3-Dichloropropane	ND	0.4	0.03
Dibromochloromethane	ND	0.4	0.02
1,2-Dibromoethane	ND	0.4	0.02
Chlorobenzene	ND	0.4	0.03
1,1,1,2-Tetrachloroethane	ND	0.4	0.03
Ethylbenzene	ND	0.4	0.03
m,p-Xylene	ND	0.8	0.05
o-Xylene	ND	0.4	0.03
Styrene	ND	0.4	0.03
Bromoform	ND	0.4	0.02
Isopropylbenzene	ND	0.4	0.03
Bromobenzene	ND	0.4	0.03
1,1,2,2-Tetrachloroethane	ND	0.4	0.03
1,2,3-Trichloropropane	ND	0.4	0.04
n-Propylbenzene	ND	0.4	0.03
2-Chlorotoluene	ND	0.4	0.03
1,3,5-Trimethylbenzene	ND	0.4	0.03
4-Chlorotoluene	ND	0.4	0.03
t-Butylbenzene	ND	0.4	0.03
1,2,4-Trimethylbenzene	ND	0.4	0.03
sec-Butylbenzene	ND	0.4	0.02
1,3-Dichlorobenzene	ND	0.4	0.04
4-Isopropyltoluene	ND	0.4	0.03
1,4-Dichlorobenzene	ND	0.4	0.03
1,2-Dichlorobenzene	ND	0.4	0.03
n-Butylbenzene	ND	0.4	0.03
1,2-Dibromo-3-chloropropane	ND	0.4	0.04
1,2,4-Trichlorobenzene	ND	0.4	0.04
Hexachlorobutadiene	ND	0.4	0.09
Naphthalene	ND	0.4	0.03
1,2,3-Trichlorobenzene	ND	0.4	0.02

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SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-1A
Lab ID:	71868-19
Date Received:	4/8/98
Date Prepared:	4/10/98
Date Analyzed:	4/10/98
% Solids	88.45
Dilution Factor	1

Volatile Organics by USEPA Method 5035/8260B Modified

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Dibromofluoromethane	107		75	154
Toluene-d8	90		65	141
Bromofluorobenzene	83		82	157

Sample results are on a dry weight basis.

Analyte	Result (ug/kg)	PQL	MDL	Flags
Dichlorodifluoromethane	ND	10	1.12	
Chloromethane	ND	10	4.39	
Vinyl Chloride	ND	10	1.29	
Bromomethane	ND	10	1.68	
Chloroethane	ND	10	4.43	
Trichlorofluoromethane	ND	10	1.68	
1,1-Dichloroethene	ND	10	2.42	
1,1,2-Trichlorotrifluoroethane	ND	10	1.98	
Acetone	20	10	3.73	J
Methylene Chloride	ND	10	1.83	
trans-1,2-Dichloroethene	ND	10	2.05	
1,1-Dichloroethane	ND	10	1.27	
2,2-Dichloropropane	ND	10	1.09	
cis-1,2-Dichloroethene	ND	10	1.55	
2-Butanone	ND	10	3.97	
Bromochloromethane	ND	10	4.07	
Chloroform	ND	10	3.64	
1,1,1-Trichloroethane	ND	10	2.87	
Carbon Tetrachloride	ND	10	1.92	
1,1-Dichloropropene	ND	10	2.15	
Benzene	ND	10	1.83	
1,2-Dichloroethane	ND	10	1.82	
Trichloroethene	ND	10	2.42	
1,2-Dichloropropane	ND	10	1.78	
Dibromomethane	ND	10	2.03	
Bromodichloromethane	ND	10	1.96	


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SOUND ANALYTICAL SERVICES, INC.

Volatile Organics by USEPA Method 5035/8260B Modified data for 71868-19 continued...

Analyte	Result (ug/kg)	PQL	MDL
cis-1,3-Dichloropropene	ND	10	1.82
Toluene	ND	10	2.2
4-Methyl-2-pentanone	ND	10	3.39
trans-1,3-Dichloropropene	ND	10	1.41
1,1,2-Trichloroethane	ND	10	1.76
Tetrachloroethene	ND	10	2.1
1,3-Dichloropropane	ND	10	1.76
Dibromochloromethane	ND	10	1.55
1,2-Dibromoethane	ND	10	1.66
2-Hexanone	ND	10	1.74
Chlorobenzene	ND	10	1.94
1,1,1,2-Tetrachloroethane	ND	10	1.66
Ethylbenzene	ND	10	1.83
m,p-Xylene	ND	20	3.65
o-Xylene	ND	10	1.82
Styrene	ND	10	1.68
Bromoform	ND	10	1.65
Isopropylbenzene	ND	10	1.9
Bromobenzene	ND	10	1.65
1,1,2,2-Tetrachloroethane	ND	10	2.16
1,2,3-Trichloropropane	ND	10	2.45
n-Propylbenzene	ND	10	1.99
2-Chlorotoluene	ND	10	1.96
4-Chlorotoluene	ND	10	2.04
1,3,5-Trimethylbenzene	ND	10	1.95
t-Butylbenzene	ND	10	2.04
1,2,4-Trimethylbenzene	ND	10	2.15
sec-Butylbenzene	ND	10	2.15
1,3-Dichlorobenzene	ND	10	1.93
1,4-Dichlorobenzene	ND	10	2.26
4-Isopropyltoluene	ND	10	2.16
1,2-Dichlorobenzene	ND	10	1.78
n-Butylbenzene	ND	10	2.31
1,2-Dibromo-3-chloropropane	ND	10	2.17
1,2,4-Trichlorobenzene	ND	10	2.08
Hexachlorobutadiene	ND	10	2.8
Naphthalene	ND	10	2.06
1,2,3-Trichlorobenzene	ND	10	2.32

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SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-1B
Lab ID:	71868-20
Date Received:	4/8/98
Date Prepared:	4/10/98
Date Analyzed:	4/10/98
% Solids	86.27
Dilution Factor	1

Volatile Organics by USEPA Method 5035/8260B Modified

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Dibromofluoromethane	107		75	154
Toluene-d8	87		65	141
Bromofluorobenzene	85		82	157

Sample results are on a dry weight basis.

Analyte	Result (ug/kg)	PQL	MDL	Flags
Dichlorodifluoromethane	ND	10	1.12	
Chloromethane	ND	10	4.39	
Vinyl Chloride	ND	10	1.29	
Bromomethane	ND	10	1.68	
Chloroethane	ND	10	4.43	
Trichlorofluoromethane	ND	10	1.68	
1,1-Dichloroethene	ND	10	2.42	
1,1,2-Trichlorotrifluoroethane	ND	10	1.98	
Acetone	ND	10	3.73	
Methylene Chloride	ND	10	1.83	
trans-1,2-Dichloroethene	ND	10	2.05	
1,1-Dichloroethane	ND	10	1.27	
2,2-Dichloropropane	ND	10	1.09	
cis-1,2-Dichloroethene	ND	10	1.55	
2-Butanone	ND	10	3.97	
Bromochloromethane	ND	10	4.07	
Chloroform	ND	10	3.64	
1,1,1-Trichloroethane	ND	10	2.87	
Carbon Tetrachloride	ND	10	1.92	
1,1-Dichloropropene	ND	10	2.15	
Benzene	ND	10	1.83	
1,2-Dichloroethane	ND	10	1.82	
Trichloroethene	ND	10	2.42	
1,2-Dichloropropane	ND	10	1.78	
Dibromomethane	ND	10	2.03	
Bromodichloromethane	ND	10	1.96	

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SOUND ANALYTICAL SERVICES, INC.

Volatile Organics by USEPA Method 5035/8260B Modified data for 71868-20 continued...

Analyte	Result (ug/kg)	PQL	MDL
cis-1,3-Dichloropropene	ND	10	1.82
Toluene	ND	10	2.2
4-Methyl-2-pentanone	ND	10	3.39
trans-1,3-Dichloropropene	ND	10	1.41
1,1,2-Trichloroethane	ND	10	1.76
Tetrachloroethene	ND	10	2.1
1,3-Dichloropropane	ND	10	1.76
Dibromochloromethane	ND	10	1.55
1,2-Dibromoethane	ND	10	1.66
2-Hexanone	ND	10	1.74
Chlorobenzene	ND	10	1.94
1,1,1,2-Tetrachloroethane	ND	10	1.66
Ethylbenzene	ND	10	1.83
m,p-Xylene	ND	21	3.65
o-Xylene	ND	10	1.82
Styrene	ND	10	1.68
Bromoform	ND	10	1.65
Isopropylbenzene	ND	10	1.9
Bromobenzene	ND	10	1.65
1,1,2,2-Tetrachloroethane	ND	10	2.16
1,2,3-Trichloropropane	ND	10	2.45
n-Propylbenzene	ND	10	1.99
2-Chlorotoluene	ND	10	1.96
4-Chlorotoluene	ND	10	2.04
1,3,5-Trimethylbenzene	ND	10	1.95
t-Butylbenzene	ND	10	2.04
1,2,4-Trimethylbenzene	ND	10	2.15
sec-Butylbenzene	ND	10	2.15
1,3-Dichlorobenzene	ND	10	1.93
1,4-Dichlorobenzene	ND	10	2.26
4-Isopropyltoluene	ND	10	2.16
1,2-Dichlorobenzene	ND	10	1.78
n-Butylbenzene	ND	10	2.31
1,2-Dibromo-3-chloropropane	ND	10	2.17
1,2,4-Trichlorobenzene	ND	10	2.08
Hexachlorobutadiene	ND	10	2.8
Naphthalene	ND	10	2.06
1,2,3-Trichlorobenzene	ND	10	2.32

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SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-2A
Lab ID:	71868-21
Date Received:	4/8/98
Date Prepared:	4/10/98
Date Analyzed:	4/10/98
% Solids	87.95
Dilution Factor	1

Volatile Organics by USEPA Method 5035/8260B Modified

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Dibromofluoromethane	120		75	154
Toluene-d8	98		65	141
Bromofluorobenzene	101		82	157

Sample results are on a dry weight basis.

Analyte	Result (ug/kg)	PQL	MDL	Flags
Dichlorodifluoromethane	ND	10	1.12	
Chloromethane	ND	10	4.39	
Vinyl Chloride	ND	10	1.29	
Bromomethane	ND	10	1.68	
Chloroethane	ND	10	4.43	
Trichlorofluoromethane	ND	10	1.68	
1,1-Dichloroethene	ND	10	2.42	
1,1,2-Trichlorotrifluoroethane	ND	10	1.98	
Acetone	15	10	3.73	J
Methylene Chloride	3.1	10	1.83	J
trans-1,2-Dichloroethene	ND	10	2.05	
1,1-Dichloroethane	ND	10	1.27	
2,2-Dichloropropane	ND	10	1.09	
cis-1,2-Dichloroethene	ND	10	1.55	
2-Butanone	ND	10	3.97	
Bromochloromethane	ND	10	4.07	
Chloroform	ND	10	3.64	
1,1,1-Trichloroethane	ND	10	2.87	
Carbon Tetrachloride	ND	10	1.92	
1,1-Dichloropropene	ND	10	2.15	
Benzene	ND	10	1.83	
1,2-Dichloroethane	ND	10	1.82	
Trichloroethene	ND	10	2.42	
1,2-Dichloropropane	ND	10	1.78	
Dibromomethane	ND	10	2.03	
Bromodichloromethane	ND	10	1.96	

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SOUND ANALYTICAL SERVICES, INC.

Volatile Organics by USEPA Method 5035/8260B Modified data for 71868-21 continued...

Analyte	Result (ug/kg)	PQL	MDL	
cis-1,3-Dichloropropene	ND	10	1.82	
Toluene	3.2	10	2.2	J
4-Methyl-2-pentanone	ND	10	3.39	
trans-1,3-Dichloropropene	ND	10	1.41	
1,1,2-Trichloroethane	ND	10	1.76	
Tetrachloroethene	4.1	10	2.1	J
1,3-Dichloropropane	ND	10	1.76	
Dibromochloromethane	ND	10	1.55	
1,2-Dibromoethane	ND	10	1.66	
2-Hexanone	ND	10	1.74	
Chlorobenzene	ND	10	1.94	
1,1,1,2-Tetrachloroethane	ND	10	1.66	
Ethylbenzene	ND	10	1.83	
m,p-Xylene	ND	20	3.65	
o-Xylene	ND	10	1.82	
Styrene	ND	10	1.68	
Bromoform	ND	10	1.65	
Isopropylbenzene	ND	10	1.9	
Bromobenzene	ND	10	1.65	
1,1,2,2-Tetrachloroethane	ND	10	2.16	
1,2,3-Trichloropropane	ND	10	2.45	
n-Propylbenzene	ND	10	1.99	
2-Chlorotoluene	ND	10	1.96	
4-Chlorotoluene	ND	10	2.04	
1,3,5-Trimethylbenzene	ND	10	1.95	
t-Butylbenzene	ND	10	2.04	
1,2,4-Trimethylbenzene	ND	10	2.15	
sec-Butylbenzene	ND	10	2.15	
1,3-Dichlorobenzene	ND	10	1.93	
1,4-Dichlorobenzene	ND	10	2.26	
4-Isopropyltoluene	ND	10	2.16	
1,2-Dichlorobenzene	ND	10	1.78	
n-Butylbenzene	ND	10	2.31	
1,2-Dibromo-3-chloropropane	ND	10	2.17	
1,2,4-Trichlorobenzene	ND	10	2.08	
Hexachlorobutadiene	ND	10	2.8	
Naphthalene	ND	10	2.06	
1,2,3-Trichlorobenzene	ND	10	2.32	

5/18/98
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SOUND ANALYTICAL SERVICES, INC.


Client Name	Ecology & Environment, Inc.
Client ID:	ST-2B
Lab ID:	71868-22
Date Received:	4/8/98
Date Prepared:	4/10/98
Date Analyzed:	4/10/98
% Solids	77.81
Dilution Factor	1

Volatile Organics by USEPA Method 5035/8260B Modified

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Dibromofluoromethane	109		75	154
Toluene-d8	99		65	141
Bromofluorobenzene	94		82	157

Sample results are on a dry weight basis.

Analyte	Result (ug/kg)	PQL	MDL	Flags
Dichlorodifluoromethane	ND	11	1.12	
Chloromethane	ND	11	4.39	
Vinyl Chloride	ND	11	1.29	
Bromomethane	ND	11	1.68	
Chloroethane	ND	11	4.43	
Trichlorofluoromethane	ND	11	1.68	
1,1-Dichloroethene	ND	11	2.42	
1,1,2-Trichlorotrifluoroethane	ND	11	1.98	
Acetone	17	11	3.73	J
Methylene Chloride	3.7	11	1.83	J
trans-1,2-Dichloroethene	ND	11	2.05	
1,1-Dichloroethane	ND	11	1.27	
2,2-Dichloropropane	ND	11	1.09	
cis-1,2-Dichloroethene	ND	11	1.55	
2-Butanone	ND	11	3.97	
Bromochloromethane	ND	11	4.07	
Chloroform	ND	11	3.64	
1,1,1-Trichloroethane	ND	11	2.87	
Carbon Tetrachloride	ND	11	1.92	
1,1-Dichloropropene	ND	11	2.15	
Benzene	ND	11	1.83	
1,2-Dichloroethane	ND	11	1.82	
Trichloroethene	ND	11	2.42	
1,2-Dichloropropane	ND	11	1.78	
Dibromomethane	ND	11	2.03	
Bromodichloromethane	ND	11	1.96	

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SOUND ANALYTICAL SERVICES, INC.

Volatile Organics by USEPA Method 5035/8260B Modified data for 71868-22 continued...

Analyte	Result (ug/kg)	PQL	MDL
cis-1,3-Dichloropropene	ND	11	1.82
Toluene	2.6	11	2.2
4-Methyl-2-pentanone	ND	11	3.39
trans-1,3-Dichloropropene	ND	11	1.41
1,1,2-Trichloroethane	ND	11	1.76
Tetrachloroethene	ND	11	2.1
1,3-Dichloropropane	ND	11	1.76
Dibromochloromethane	ND	11	1.55
1,2-Dibromoethane	ND	11	1.66
2-Hexanone	ND	11	1.74
Chlorobenzene	ND	11	1.94
1,1,1,2-Tetrachloroethane	ND	11	1.66
Ethylbenzene	ND	11	1.83
m,p-Xylene	ND	23	3.65
o-Xylene	ND	11	1.82
Styrene	ND	11	1.68
Bromoform	ND	11	1.65
Isopropylbenzene	ND	11	1.9
Bromobenzene	ND	11	1.65
1,1,2,2-Tetrachloroethane	ND	11	2.16
1,2,3-Trichloropropane	ND	11	2.45
n-Propylbenzene	ND	11	1.99
2-Chlorotoluene	ND	11	1.96
4-Chlorotoluene	ND	11	2.04
1,3,5-Trimethylbenzene	ND	11	1.95
t-Butylbenzene	ND	11	2.04
1,2,4-Trimethylbenzene	ND	11	2.15
sec-Butylbenzene	ND	11	2.15
1,3-Dichlorobenzene	ND	11	1.93
1,4-Dichlorobenzene	ND	11	2.26
4-Isopropyltoluene	ND	11	2.16
1,2-Dichlorobenzene	ND	11	1.78
n-Butylbenzene	ND	11	2.31
1,2-Dibromo-3-chloropropane	ND	11	2.17
1,2,4-Trichlorobenzene	ND	11	2.08
Hexachlorobutadiene	ND	11	2.8
Naphthalene	ND	11	2.06
1,2,3-Trichlorobenzene	ND	11	2.32

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SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-3A
Lab ID:	71868-26
Date Received:	4/8/98
Date Prepared:	4/10/98
Date Analyzed:	4/10/98
% Solids	-
Dilution Factor	1

Volatile Organics by USEPA Method 5030/8260

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Dibromofluoromethane	102		77	116
Toluene-D8	100		91	107
Bromofluorobenzene	97		92	109

Analyte	Result (ug/L)	PQL	MDL	Flags
Dichlorodifluoromethane	ND	0.4	0.04	
Chloromethane	ND	0.4	0.07	
Vinyl Chloride	ND	0.4	0.02	
Bromomethane	ND	0.4	0.18	
Chloroethane	ND	0.4	0.03	
Trichlorofluoromethane	ND	0.4	0.02	
1,1-Dichloroethene	ND	0.4	0.02	
Methylene Chloride	ND	0.4	0.02	
trans-1,2-Dichloroethene	ND	0.4	0.02	
1,1-Dichloroethane	ND	0.4	0.03	
2,2-Dichloropropane	ND	0.4	0.1	
cis-1,2-Dichloroethene	ND	0.4	0.02	
Bromochloromethane	ND	0.4	0.02	
Chloroform	ND	0.4	0.02	
1,1,1-Trichloroethane	ND	0.4	0.03	
Carbon tetrachloride	ND	0.4	0.04	
1,1-Dichloropropene	ND	0.4	0.07	
Benzene	ND	0.4	0.09	
1,2-Dichloroethane	ND	0.4	0.02	
Trichloroethene	ND	0.4	0.02	
1,2-Dichloropropane	ND	0.4	0.02	
Dibromomethane	ND	0.4	0.02	
Bromodichloromethane	ND	0.4	0.02	
cis-1,3-Dichloropropene	ND	0.4	0.03	
Toluene	ND	0.4	0.03	
trans-1,3-Dichloropropene	ND	0.4	0.04	

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SOUND ANALYTICAL SERVICES, INC.

Volatile Organics by USEPA Method 5030/8260 data for 71868-26 continued...

Analyte	Result (ug/L)	PQL	MDL
1,1,2-Trichloroethane	ND	0.4	0.02
Tetrachloroethene	ND	0.4	0.02
1,3-Dichloropropane	ND	0.4	0.03
Dibromochloromethane	ND	0.4	0.02
1,2-Dibromoethane	ND	0.4	0.02
Chlorobenzene	ND	0.4	0.03
1,1,1,2-Tetrachloroethane	ND	0.4	0.03
Ethylbenzene	ND	0.4	0.03
m,p-Xylene	ND	0.8	0.05
o-Xylene	ND	0.4	0.03
Styrene	ND	0.4	0.03
Bromoform	ND	0.4	0.02
Isopropylbenzene	ND	0.4	0.03
Bromobenzene	ND	0.4	0.03
1,1,2,2-Tetrachloroethane	ND	0.4	0.03
1,2,3-Trichloropropane	ND	0.4	0.04
n-Propylbenzene	ND	0.4	0.03
2-Chlorotoluene	ND	0.4	0.03
1,3,5-Trimethylbenzene	ND	0.4	0.03
4-Chlorotoluene	ND	0.4	0.03
t-Butylbenzene	ND	0.4	0.03
1,2,4-Trimethylbenzene	ND	0.4	0.03
sec-Butylbenzene	ND	0.4	0.02
1,3-Dichlorobenzene	ND	0.4	0.04
4-Isopropyltoluene	ND	0.4	0.03
1,4-Dichlorobenzene	ND	0.4	0.03
1,2-Dichlorobenzene	ND	0.4	0.03
n-Butylbenzene	ND	0.4	0.03
1,2-Dibromo-3-chloropropane	ND	0.4	0.04
1,2,4-Trichlorobenzene	ND	0.4	0.04
Hexachlorobutadiene	ND	0.4	0.09
Naphthalene	ND	0.4	0.03
1,2,3-Trichlorobenzene	ND	0.4	0.02

5/18/98
(Signature)


SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-3B
Lab ID:	71868-29
Date Received:	4/8/98
Date Prepared:	4/10/98
Date Analyzed:	4/10/98
% Solids	-
Dilution Factor	1

Volatile Organics by USEPA Method 5030/8260

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Dibromofluoromethane	101		77	116
Toluene-D8	98		91	107
Bromofluorobenzene	102		92	109

Analyte	Result (ug/L)	PQL	MDL	Flags
Dichlorodifluoromethane	ND	0.4	0.04	
Chloromethane	ND	0.4	0.07	
Vinyl Chloride	ND	0.4	0.02	
Bromomethane	ND	0.4	0.18	
Chloroethane	ND	0.4	0.03	
Trichlorofluoromethane	ND	0.4	0.02	
1,1-Dichloroethene	ND	0.4	0.02	
Methylene Chloride	ND	0.4	0.02	
trans-1,2-Dichloroethene	ND	0.4	0.02	
1,1-Dichloroethane	ND	0.4	0.03	
2,2-Dichloropropane	ND	0.4	0.1	
cis-1,2-Dichloroethene	ND	0.4	0.02	
Bromochloromethane	ND	0.4	0.02	
Chloroform	ND	0.4	0.02	
1,1,1-Trichloroethane	ND	0.4	0.03	
Carbon tetrachloride	ND	0.4	0.04	
1,1-Dichloropropene	ND	0.4	0.07	
Benzene	ND	0.4	0.09	
1,2-Dichloroethane	ND	0.4	0.02	
Trichloroethene	ND	0.4	0.02	
1,2-Dichloropropane	ND	0.4	0.02	
Dibromomethane	ND	0.4	0.02	
Bromodichloromethane	ND	0.4	0.02	
cis-1,3-Dichloropropene	ND	0.4	0.03	
Toluene	ND	0.4	0.03	
trans-1,3-Dichloropropene	ND	0.4	0.04	

5/18/98


SOUND ANALYTICAL SERVICES, INC.

Volatile Organics by USEPA Method 5030/8260 data for 71868-29 continued...

Analyte	Result (ug/L)	PQL	MDL
1,1,2-Trichloroethane	ND	0.4	0.02
Tetrachloroethene	ND	0.4	0.02
1,3-Dichloropropane	ND	0.4	0.03
Dibromochloromethane	ND	0.4	0.02
1,2-Dibromoethane	ND	0.4	0.02
Chlorobenzene	0.94	0.4	0.03
1,1,1,2-Tetrachloroethane	ND	0.4	0.03
Ethylbenzene	ND	0.4	0.03
m,p-Xylene	ND	0.8	0.05
o-Xylene	ND	0.4	0.03
Styrene	ND	0.4	0.03
Bromoform	ND	0.4	0.02
Isopropylbenzene	ND	0.4	0.03
Bromobenzene	ND	0.4	0.03
1,1,2,2-Tetrachloroethane	ND	0.4	0.03
1,2,3-Trichloropropane	ND	0.4	0.04
n-Propylbenzene	ND	0.4	0.03
2-Chlorotoluene	ND	0.4	0.03
1,3,5-Trimethylbenzene	ND	0.4	0.03
4-Chlorotoluene	ND	0.4	0.03
t-Butylbenzene	ND	0.4	0.03
1,2,4-Trimethylbenzene	ND	0.4	0.03
sec-Butylbenzene	ND	0.4	0.02
1,3-Dichlorobenzene	ND	0.4	0.04
4-Isopropyltoluene	ND	0.4	0.03
1,4-Dichlorobenzene	ND	0.4	0.03
1,2-Dichlorobenzene	ND	0.4	0.03
n-Butylbenzene	ND	0.4	0.03
1,2-Dibromo-3-chloropropane	ND	0.4	0.04
1,2,4-Trichlorobenzene	ND	0.4	0.04
Hexachlorobutadiene	ND	0.4	0.09
Naphthalene	ND	0.4	0.03
1,2,3-Trichlorobenzene	ND	0.4	0.02

5/18/98
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SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-3C
Lab ID:	71868-32
Date Received:	4/8/98
Date Prepared:	4/10/98
Date Analyzed:	4/10/98
% Solids	-
Dilution Factor	1

Volatile Organics by USEPA Method 5030/8260

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Dibromofluoromethane	102		77	116
Toluene-D8	98		91	107
Bromofluorobenzene	102		92	109

Analyte	Result (ug/L)	PQL	MDL	Flags
Dichlorodifluoromethane	ND	0.4	0.04	
Chloromethane	ND	0.4	0.07	
Vinyl Chloride	ND	0.4	0.02	
Bromomethane	ND	0.4	0.18	
Chloroethane	ND	0.4	0.03	
Trichlorofluoromethane	ND	0.4	0.02	
1,1-Dichloroethene	ND	0.4	0.02	
Methylene Chloride	ND	0.4	0.02	
trans-1,2-Dichloroethene	ND	0.4	0.02	
1,1-Dichloroethane	ND	0.4	0.03	
2,2-Dichloropropane	ND	0.4	0.1	
cis-1,2-Dichloroethene	ND	0.4	0.02	
Bromochloromethane	ND	0.4	0.02	
Chloroform	ND	0.4	0.02	
1,1,1-Trichloroethane	ND	0.4	0.03	
Carbon tetrachloride	ND	0.4	0.04	
1,1-Dichloropropene	ND	0.4	0.07	
Benzene	ND	0.4	0.09	
1,2-Dichloroethane	ND	0.4	0.02	
Trichloroethene	ND	0.4	0.02	
1,2-Dichloropropane	ND	0.4	0.02	
Dibromomethane	ND	0.4	0.02	
Bromodichloromethane	ND	0.4	0.02	
cis-1,3-Dichloropropene	ND	0.4	0.03	
Toluene	ND	0.4	0.03	
trans-1,3-Dichloropropene	ND	0.4	0.04	

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SOUND ANALYTICAL SERVICES, INC.

Volatile Organics by USEPA Method 5030/8260 data for 71868-32 continued...

Analyte	Result (ug/L)	PQL	MDL
1,1,2-Trichloroethane	ND	0.4	0.02
Tetrachloroethene	ND	0.4	0.02
1,3-Dichloropropane	ND	0.4	0.03
Dibromochloromethane	ND	0.4	0.02
1,2-Dibromoethane	ND	0.4	0.02
Chlorobenzene	0.7	0.4	0.03
1,1,1,2-Tetrachloroethane	ND	0.4	0.03
Ethylbenzene	ND	0.4	0.03
m,p-Xylene	ND	0.8	0.05
o-Xylene	ND	0.4	0.03
Styrene	ND	0.4	0.03
Bromoform	ND	0.4	0.02
Isopropylbenzene	ND	0.4	0.03
Bromobenzene	ND	0.4	0.03
1,1,2,2-Tetrachloroethane	ND	0.4	0.03
1,2,3-Trichloropropane	ND	0.4	0.04
n-Propylbenzene	ND	0.4	0.03
2-Chlorotoluene	ND	0.4	0.03
1,3,5-Trimethylbenzene	ND	0.4	0.03
4-Chlorotoluene	ND	0.4	0.03
t-Butylbenzene	ND	0.4	0.03
1,2,4-Trimethylbenzene	ND	0.4	0.03
sec-Butylbenzene	ND	0.4	0.02
1,3-Dichlorobenzene	ND	0.4	0.04
4-Isopropyltoluene	ND	0.4	0.03
1,4-Dichlorobenzene	ND	0.4	0.03
1,2-Dichlorobenzene	ND	0.4	0.03
n-Butylbenzene	ND	0.4	0.03
1,2-Dibromo-3-chloropropane	ND	0.4	0.04
1,2,4-Trichlorobenzene	ND	0.4	0.04
Hexachlorobutadiene	ND	0.4	0.09
Naphthalene	ND	0.4	0.03
1,2,3-Trichlorobenzene	ND	0.4	0.02

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SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	TB-1-4/6/98
Lab ID:	71868-33
Date Received:	4/8/98
Date Prepared:	4/10/98
Date Analyzed:	4/10/98
% Solids	-
Dilution Factor	1

Volatile Organics by USEPA Method 5030/8260

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Dibromofluoromethane	101		77	116
Toluene-D8	99		91	107
Bromofluorobenzene	101		92	109

Analyte	Result (ug/L)	PQL	MDL	Flags
Dichlorodifluoromethane	ND	0.4	0.04	
Chloromethane	ND	0.4	0.07	
Vinyl Chloride	ND	0.4	0.02	
Bromomethane	ND	0.4	0.18	
Chloroethane	ND	0.4	0.03	
Trichlorofluoromethane	ND	0.4	0.02	
1,1-Dichloroethene	ND	0.4	0.02	
Methylene Chloride	ND	0.4	0.02	
trans-1,2-Dichloroethene	ND	0.4	0.02	
1,1-Dichloroethane	ND	0.4	0.03	
2,2-Dichloropropane	ND	0.4	0.1	
cis-1,2-Dichloroethene	ND	0.4	0.02	
Bromochloromethane	ND	0.4	0.02	
Chloroform	ND	0.4	0.02	
1,1,1-Trichloroethane	ND	0.4	0.03	
Carbon tetrachloride	ND	0.4	0.04	
1,1-Dichloropropene	ND	0.4	0.07	
Benzene	ND	0.4	0.09	
1,2-Dichloroethane	ND	0.4	0.02	
Trichloroethene	ND	0.4	0.02	
1,2-Dichloropropane	ND	0.4	0.02	
Dibromomethane	ND	0.4	0.02	
Bromodichloromethane	ND	0.4	0.02	
cis-1,3-Dichloropropene	ND	0.4	0.03	
Toluene	ND	0.4	0.03	
trans-1,3-Dichloropropene	ND	0.4	0.04	

5/18/98
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SOUND ANALYTICAL SERVICES, INC.

Volatile Organics by USEPA Method 5030/8260 data for 71868-33 continued...

Analyte	Result (ug/L)	PQL	MDL
1,1,2-Trichloroethane	ND	0.4	0.02
Tetrachloroethene	ND	0.4	0.02
1,3-Dichloropropane	ND	0.4	0.03
Dibromochloromethane	ND	0.4	0.02
1,2-Dibromoethane	ND	0.4	0.02
Chlorobenzene	ND	0.4	0.03
1,1,1,2-Tetrachloroethane	ND	0.4	0.03
Ethylbenzene	ND	0.4	0.03
m,p-Xylene	ND	0.8	0.05
o-Xylene	ND	0.4	0.03
Styrene	ND	0.4	0.03
Bromoform	ND	0.4	0.02
Isopropylbenzene	ND	0.4	0.03
Bromobenzene	ND	0.4	0.03
1,1,2,2-Tetrachloroethane	ND	0.4	0.03
1,2,3-Trichloropropane	ND	0.4	0.04
n-Propylbenzene	ND	0.4	0.03
2-Chlorotoluene	ND	0.4	0.03
1,3,5-Trimethylbenzene	ND	0.4	0.03
4-Chlorotoluene	ND	0.4	0.03
t-Butylbenzene	ND	0.4	0.03
1,2,4-Trimethylbenzene	ND	0.4	0.03
sec-Butylbenzene	ND	0.4	0.02
1,3-Dichlorobenzene	ND	0.4	0.04
4-Isopropyltoluene	ND	0.4	0.03
1,4-Dichlorobenzene	ND	0.4	0.03
1,2-Dichlorobenzene	ND	0.4	0.03
n-Butylbenzene	ND	0.4	0.03
1,2-Dibromo-3-chloropropane	ND	0.4	0.04
1,2,4-Trichlorobenzene	ND	0.4	0.04
Hexachlorobutadiene	ND	0.4	0.09
Naphthalene	ND	0.4	0.03
1,2,3-Trichlorobenzene	ND	0.4	0.02

5/18/98 *(Signature)*

7/11/8

CHAIN OF CUSTODY RECORD

75 Hawthorne Street
San Francisco, California 94105

PROJ. NO.		PROJECT NAME		NO. OF CONTAINERS		VOCs EPA 8260 REST/PCBS EPA 8080 17 CALIFORNIA METALS SVOCs EPA 8270 TOTAL CHLORIDE EPA 8010B TPH (9+2) EPA 8015M						REMARKS		
SAMPLERS: (Signature)														
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION									
✓ ST-4	4/6	1559		X	ST-4A	2X40m	X	X	X	X				
✓ ST-4		1608		X	ST-4B	2X40m	X	X	X	X				
✓ ST-5		1630		X	ST-5	2X40m	X	X	X	X				
✓ DW-1		1617		X	DW-1	2X40m	X	X	X	X		DO MS/MSD IF SUFFICIENT SAMPLE VOLUME		
✓ BKG-1		1650		X	BKG-1	2X40m	X	X	X	X				
✓ ST-3		1545		X	ST-3D	2X1L			X					
✓ ST-3		1545		X	ST-3D	1X1L		X						
✓ ST-3		1545		X	ST-3D	4X40m	X							
✓ ST-3		1550		X	ST-3E	2X1L			X	X				
✓ ST-3		1550		X	ST-3E	1X1L		X						
✓ ST-3		1550		X	ST-3E	4X40m	X							
✓ UST-1		1635		X	UST-1	1X1L			X			* As requested in contract w/ Sound Laboratory		
✓ UST-1		1635		X	UST-1	1X1L		X						
✓ UST-1		1635		X	UST-1	6X40m	X							
✓ TB		1800		X	TB-2 - 4/6/98	1X40m	X							
Relinquished by: (Signature)			Date / Time		Received by: (Signature)			Relinquished by: (Signature)			Date / Time		Received by: (Signature)	
M. K. K.			4/7/98 1200		FED-X									
Relinquished by: (Signature)			Date / Time		Received by: (Signature)			Relinquished by: (Signature)			Date / Time		Received by: (Signature)	
Relinquished by: (Signature)			Date / Time		Received for Laboratory by: (Signature)			Date / Time		Remarks				
					S. Liang			4/8/98 930AM		FED-X B/L # 804733300967				

REGION 5

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CHAIN OF CUSTODY RECORD

75 Hawthorne Street
San Francisco, California 94105

PROJ. NO.		PROJECT NAME				NO. OF CON- TAINERS	<div style="display: flex; flex-direction: column; align-items: center;"> <div>VOCs EPA 8260</div> <div>pesticides EPA 8080</div> <div>13 CHEMICAL METALS</div> <div>SIVOCs EPA 8270</div> <div>TOXIC CYANIDE EPA 9010B</div> <div>TPH (grd) EPA 8015M</div> </div>						REMARKS
KJ9103		WDI TANK ASSESSMENT											
SAMPLERS: (Signature)													
<div style="display: flex; justify-content: space-between;"> <div>M. Schumacher</div> <div>J. J. Japp</div> </div>													
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION								
ST-1	4/6	1420		X	ST-1A	2x40z	X	X	X	X	X	X	
ST-1		1425		X	ST-1B		X	X	X	X	X	X	
✓ ST-2		1445		X	ST-2A		X	X	X	X	X	X	
✓ ST-2		1451		X	ST-2B		X	X	X	X	X	X	
✓ ST-3		1520		X	ST-3A	1x1L.						X	NaOH pH > 12
✓ ST-3		1520		X	ST-3A	1x1L.			X				
✓ ST-3		1520		X	ST-3A	1x1L.		X					
✓ ST-3		1520		X	ST-3A	6x40ml	X					X	
✓ ST-3		1525		X	ST-3B	2x1L.			X		X		NaOH pH > 12 ON 9010 ANALYSIS
✓ ST-3		1525		X	ST-3B	1x1L.		X					
✓ ST-3		1525		X	ST-3B	4x40ml	X					X	* AS REQUESTED IN CONTRACT w/
✓ ST-3		1530		X	ST-3C	2x1L.			X		X		SOUND LABORATORY
✓ ST-3		1530		X	ST-3C	1x1L.		X					
✓ ST-3		1530		X	ST-3C	4x40ml	X					X	
TB		1800		X	TB-1-4/6/98	1x40ml	X						
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Relinquished by: (Signature)		Date / Time		Received by: (Signature)			
M. Schumacher		4/7/98 1200		FED-X									
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Relinquished by: (Signature)		Date / Time		Received by: (Signature)			
Relinquished by: (Signature)		Date / Time		Received for Laboratory by: (Signature)		Date / Time		Remarks					
				S. J. Japp		4/8/98 930AM		FED-X B/L # 804733300967					

SOUND ANALYTICAL SERVICES, INC.

Client: Ecology & Environment, Inc.

Date: April 29, 1998

Project: KJ9103 WDI Tank Assessment

Lab No.: 71868

SAMPLE EXTRACTION AND ANALYSIS

VOLATILE ORGANICS

Samples 71868-1 through 71868-5, 71868-19 through 71868-22 (soils) and 71868-8, 71868-11, 71868-14, 71868-15, 71868-18, 71868-26, 71868-29, 71868-32 and 71868-33 (liquids) were analyzed for volatile organics in accordance with EPA Method 8260. The soil samples were prepared and analyzed on 4-10-98. The liquid samples were prepared and analyzed on 4-10-98.

Sample 71868-14 was received at a pH of 7. Sample 71868-18 was received at a pH of 5.

All quality control was within the acceptance limits.

Acetone calculation from sample 71868-1

$$\frac{18.98 \times 5\text{ml}}{5.4507\text{g} \times 0.8354}$$

SEMIVOLATILE ORGANICS

Samples 71868-1 through 71868-5 and 71868-20 through 71868-22 (soils) were analyzed for semivolatile organics in accordance with EPA Method 8270. The samples were prepared and analyzed on 4-10-98.

All quality control was within the acceptance limits.

$$\frac{\text{Instrument reading} \times \text{final volume} \times \text{dilution factor}}{\text{sample weight or volume} \times \text{dry weight}}$$

PESTICIDES AND PCBs

Samples 71868-1 through 71868-5, 71868-19 through 71868-22 (soils) and 71868-7, 71868-10, 71868-13, 71868-17, 71868-25, 71868-28, and 71868-31 (liquids) were analyzed for pesticides and PCBs in accordance with EPA Method 8081. The soil samples were extracted on 4-15-98 analyzed on 4-18-98. The liquid samples were extracted on 4-13-98 and analyzed on 4-16-98.

Second column confirmation was performed. The values are flagged "C1" or "C2" as deemed appropriate.

The percent recovery of DCB (surrogate) in the method blank associated with the liquid samples failed low. Reanalysis exhibited similar results. Insufficient sample volume was available for reextraction and reanalysis.

All quality control was within the acceptance limits.

$$\frac{\text{Extract concentration} \times \text{extract volume} \times \text{dilution factor}}{\text{Sample volume or weight} \times \text{percent solids}}$$

ANALYTICAL DATA REVIEW SUMMARY

Site Name: WDI Tank Assessment
Location: Santa Fe Springs, California
PAN No.: 0294-WDSF-XX
TDD No.: 09-9803-0006
Laboratory: Sound Analytical Services, Inc.
Sampling Date: April 6, 1998
Analytical Method: 9012
Sample Matrix: Water

Sample No.	Sample I.D.	Laboratory I.D.
1	ST-3D	71868-06
2	ST-3E	71868-09
3	ST-3A	71868-23
4	ST-3B	71868-27
5	ST-3C	71868-30

Data Reviewer: Trisha J. Woolslayer *Trisha J. Woolslayer 5/20/98*
Chemist QA Reviewer: _____
START PM Acceptance: _____

METALS DATA VALIDATION WORKSHEET - SUMMARY

Report No.: 71868
Laboratory: Sound Analytical Services, Inc.
Reviewer: Trisha J. Woolslayer
Review Date: April 6, 1998
Analytical Method: 9012

No. of Samples **Water:** 5 **Solid:** _____ **Other:** _____

Indicate with a YES or NO whether each item is within QC limits.

1.	Holding Times	<u>Y</u>
2.	Matrix Spike/Spike Duplicate	<u>Y</u>
3.	Blanks	<u>Y</u>
4.	Initial Calibration	<u>Y</u>
5.	Continuing Calibration	<u>Y</u>
6.	Laboratory Control Sample (LCS)	<u>Y</u>
7.	ICP Interference check sample	<u>N/A</u>
8.	Compound Quantitation	<u>N/A</u>
9.	Method of Standard Addition (MSA)	<u>N/A</u>
10.	ICP Serial Dilution	<u>N/A</u>
11.	Quarterly IDLs and ICP Linear Ranges	<u>N/A</u>
12.	System Performance	<u>Y</u>
13.	Overall Assessment	<u>Y</u>

Other Problems/Comments: _____

METALS AND CYANIDE ANALYSES

DATA PACKAGE COMPLETENESS CHECKLIST

Checklist Code:	<u>X</u>	Included: no problems
	<u>*</u>	Included: problems noted in review
	<u>O</u>	Not Included and/or Not Available
	<u>NR</u>	Not Required
	<u>RS</u>	Provided As Re-submission

X Case Narrative

Quality Control Summary Package

<u>X</u>	Data Summary Sheets (Form I)
<u>X</u>	Initial and Continuing Calibration (Form IIA)
<u>O</u>	CRDL Standard Results (Form IIB)
<u>X</u>	Calibration and Preparation Blank Results (Form III)
<u>NR</u>	ICP Interference Check Sample (Form IV)
<u>X</u>	Spike Recovery Results (Form VA)
<u>X</u>	Duplicate Sample Results
<u>X</u>	Laboratory Control Sample Results (Form VII)
<u>NR</u>	Standard Addition Results (Form VIII)
<u>NR</u>	ICP Serial Dilution (Form IX)
<u>NR</u>	Instrument Detection Limits: Quarterly (Form X)
<u>NR</u>	ICP Interelement Correction Factors (Form XI)
<u>X</u>	NR ICP Linear Ranges: Quarterly (Form XII)
<u>X</u>	Preparation Log (Form 13)
<u>X</u>	Analysis Run Log (Form 14)

Raw QC Data Package Section

<u>X</u>	Chain-of-Custody Records
<u>O</u>	Quantitation Reports
<u>X</u>	Raw Instrument Printouts
<u>X</u>	Sample Preparation Notebook Pages
<u>X</u>	Logbook and Worksheet Pages
<u>X</u>	Percent Solids Determination

I. HOLDING TIMES

Acceptable X Outside QC Limits

Samples were prepared and analyzed within applicable holding times except as noted under comments. In addition, no problems were identified with regard to sample preservation or custody unless specified. For those sample fractions prepared or analyzed outside holding time requirements, the results have been qualified as estimated (J).

Cyanide	14 Days	Hexavalent Chromium	24 hours
Mercury	28 Days	All Other Metals	6 months

Comments:

No comments.

II. INITIAL AND CONTINUING CALIBRATION VERIFICATION

Acceptable X Outside QC Limits

Except as flagged below, a calibration verification standard and blank were analyzed at the beginning of the analysis and after every tenth sample. For AA methods, ICV recoveries were within the range of 90-110%. Other recoveries were within applicable control limits (Mercury or Tin 80-120%; Other Metals 90-110%; Cyanide 85-115%) unless noted. Calibration QC failures result in qualification of associated data as estimated (J). Any sample results greater than 110% of the highest standard were also flagged "J." Calibration data which is unacceptably out of control (Mercury or Tin <65% or >135%; Other Metals <75% or >125%; Cyanide <70% or >130%) may result in rejection (R) of all associated data.

Comments:

No comments.

IIIA. ERROR DETERMINATION

 X Matrix Spike/Spike Duplicate Samples Analyzed
 No Spike Samples Analyzed

Matrix spike samples may be used for a qualitative indication of result bias and precision. Spike recoveries of less than 80% or greater than 120% may be sufficient cause to flag associated data as estimated (J). This is left to the professional judgement of the data validator.

Comments:

No comments.

III B. METHOD PERFORMANCE

Check whether an aqueous LCS (Blank Spike) was analyzed for every 20 samples or one LCS per batch which ever was greater. Check also that on solid LCS was analyzed at least every month. The LCS recovery should be between 80-120%. If the recovery is 30-79% or >120% all positive data associated with this LCS is qualified as estimated (J). All negative data associated with the standard are also considered estimated (J) if the recovery is between 30-79%. If the LCS result is <30% all associated data are qualified as rejected (R).

Comments:

No comments.

IV. BLANKS AND BACKGROUND SAMPLES

Acceptable X Detection Limits Adjusted

The following blanks were analyzed:

<u> X </u>	Preparation Blanks	<u> </u>	Field Blanks
<u> X </u>	Calibration Blanks		Rinsate Blanks
<u> </u>	Background Samples		

The appropriate blanks were analyzed at the proper frequency except as noted below. Any compound detected in the sample and also detected in any associated blank, must be qualified as non-detect (UJ) when the sample concentration is less than five-times the blank concentration (detection limit was recalculated to be five-times the blank level). If blank contamination is over acceptable levels, data may be rejected (R).

Comments:

No comments.

VI. OVERALL ASSESSMENT OF DATA

On the basis of this review, the following determination has been made with regard to the overall data usability for the specified level.

Acceptable	<u> X </u>	Accepted with Qualification	<u> </u>
Rejected	<u> </u>		<u> </u>

Accepted data meet the minimum requirements for the following EPA data category:

ERS Screening	<u> </u>
Non-definitive with 10% Conformation by Definitive Methodology	<u> </u>
Definitive	<u> X </u>
Without Comprehensive Statistical Error Determination	<u> X </u>
With Comprehensive Statistical error Determination	<u> </u>

Any qualifications to individual sample analysis results are detailed in the appropriate section above or appear under the comments section below. In cases where several QC criteria are out of specification, it may be appropriate to further qualify the data usability. The data reviewer must use professional judgment and express concerns and comments on the data validity for each specific data package.

Comments:

No comments.

ANALYTICAL DATA REVIEW

APPENDIX A

DATA VALIDATION QUALIFIERS

The following list of data validation qualifiers may be used in this data review package:

J	The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or because quality control criteria were not met.
N	Presumptive evidence of presence of material.
NJ	Presumptive evidence of the presence of the material at an estimated quantity.
U	The material was analyzed for, but not detected. The associated numerical value is the sample detection limit or adjusted sample detection limit.
UJ	The material was analyzed for, but not detected. The reported detection limit is estimated because quality control criteria were not met.
R	The sample results are rejected (analyte may or may not be present) due to gross deficiencies in quality control criteria. Any reported value is unusable
RND	Recovery Not Determined (Optional).
PND	Precision Not Determined (Optional).

ANNOTATED DATA SUMMARY SHEETS

Hand-annotated copies of the Data Summary Sheets from the analytical data package follow. When appropriate, detection limits have been adjusted to reflect effects of relevant qualifications noted during the data review. Errors in the reporting of detected compound results will usually not be changed by hand. In these cases, the laboratory may be required to re-submit portions of the data package and any affected Data summary Sheets. Any additional quality control failures have been flagged using the above listed data validation qualifiers.

Pages of Annotated Data summary Sheets follow.

ANALYTICAL DATA REVIEW

APPENDIX A

DATA VALIDATION QUALIFIERS

The following list of data validation qualifiers may be used in this data review package:

- | | |
|-----|--|
| J | The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or because quality control criteria were not met. |
| N | Presumptive evidence of presence of material. |
| NJ | Presumptive evidence of the presence of the material at an estimated quantity. |
| U | The material was analyzed for, but not detected. The associated numerical value is the sample detection limit or adjusted sample detection limit. |
| UJ | The material was analyzed for, but not detected. The reported detection limit is estimated because quality control criteria were not met. |
| R | The sample results are rejected (analyte may or may not be present) due to gross deficiencies in quality control criteria. Any reported value is unusable |
| RND | Recovery Not Determined (Optional). |
| PND | Precision Not Determined (Optional). |

ANNOTATED DATA SUMMARY SHEETS

Hand-annotated copies of the Data Summary Sheets from the analytical data package follow. When appropriate, detection limits have been adjusted to reflect effects of relevant qualifications noted during the data review. Errors in the reporting of detected compound results will usually not be changed by hand. In these cases, the laboratory may be required to re-submit portions of the data package and any affected Data summary Sheets. Any additional quality control failures have been flagged using the above listed data validation qualifiers.

Pages of Annotated Data summary Sheets follow.

SOUND ANALYTICAL SERVICES, INC.

ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (253)922-2310 - FAX (253)922-5047

Report To: Ecology & Environment

Date: April 20, 1998

Report On: Analysis of Liquid

Report No.: 71868

IDENTIFICATION:

Samples received on 04-08-98

Project: KJ98103 WDI Tank Assessment

ANALYSIS:

General Chemistry
Units: mg/L

Lab Sample No. 71868-6

Client ID: ST-3D

<u>Parameter</u>	<u>Method</u>	<u>Result</u>	<u>PQL</u>
Cyanide	EPA 9010	ND	0.01

Lab Sample No. 71868-9

Client ID: ST-3E

<u>Parameter</u>	<u>Method</u>	<u>Result</u>	<u>PQL</u>
Cyanide	EPA 9010	ND	0.01

Lab Sample No. 71868-23

Client ID: ST-3A

<u>Parameter</u>	<u>Method</u>	<u>Result</u>	<u>PQL</u>
Cyanide	EPA 9010	ND	0.01

ND - Not Detected

PQL - Practical Quantitation Limit

5/20/98
(Signature)

SOUND ANALYTICAL SERVICES, INC.

Ecology & Environment
Project: KJ98103 WDI Tank Assessment
Report No. 71868
April 20, 1998

General Chemistry Units: mg/L

Lab Sample No. 71868-27

Client ID: ST-3B

<u>Parameter</u>	<u>Method</u>	<u>Result</u>	<u>PQL</u>
Cyanide	EPA 9010	ND	0.01

Lab Sample No. 71868-30

Client ID: ST-3C

<u>Parameter</u>	<u>Method</u>	<u>Result</u>	<u>PQL</u>
Cyanide	EPA 9010	ND	0.01

ND - Not Detected
PQL - Practical Quantitation Limit

5/20/98
JW

CHAIN OF CUSTODY RECORD

REGION 9
Hawaii State
San Francisco, California 94105

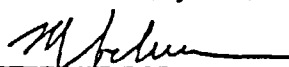
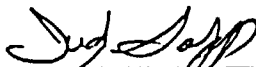
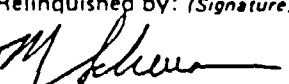

PROJ. NO.		PROJECT NAME				NO. OF CON- TAINERS	REMARKS					
SAMPLERS: (Signature)							VOCs EPA 8260 Pesticides EPA 8080 17 CALIFORNIA METALS SVOCs EPA 8270 TOTAL CHLORIDE EPA 8010B TPH (9+2) EPA 8015M					
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION							
ST-4	4/6	1559		X	ST-4A	2X40m	X	X	X	X	X	
ST-4		1608		X	ST-4B	2X40m	X	X	X	X	X	
ST-5		1630		X	ST-5	2X40m	X	X	X	X	X	
DW-1		1617		X	DW-1	2X40m	X	X	X	X	X	DO MS/MSD IF SUFFICIENT SAMPLE VOLUME
BKG-1		1650		X	BKG-1	2X40m	X	X	X	X	X	
ST-3		1545		X	ST-3D	2X1L			X	X		
ST-3		1545		X	ST-3D	1X1L		X				
ST-3		1545		X	ST-3D	4X40m	X				X	
ST-3		1550		X	ST-3E	2X1L		X		X		
ST-3		1550		X	ST-3E	1X1L		X				
ST-3		1550		X	ST-3E	4X40m	X				X	
UST-1		1635		X	UST-1	1X1L		X				* As requested in contract w/ Sound Laboratory
UST-1		1635		X	UST-1	1X1L		X				
UST-1		1635		X	UST-1	6X40m	X				X	
TB		1800		X	TB-2 - 4/6/98	1X40m	X					
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Relinquished by: (Signature)		Date / Time		Received by: (Signature)		
M. Lehu		4/7/98 1200		FED-X								
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Relinquished by: (Signature)		Date / Time		Received by: (Signature)		
Relinquished by: (Signature)		Date / Time		Received for Laboratory by: (Signature)		Date / Time		Remarks				
				S. Givana		4/8/98 930AM		FED-X B/L # 804733300967				

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

13 Hawthorne Street

San Francisco, California 94105

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PROJ. NO.		PROJECT NAME		NO. OF CONTAINERS		VOCs EPA 8260 PEST/BBs EPA 8080 17 CALIFORNIA METALS SVOCs EPA 8270 TOTAL CYANIDE EPA 9010 B TPH (g+L) * EPA 8015						REMARKS	
KJ9103		WDI TANK ASSESSMENT											
SAMPLERS: (Signature)													
 													
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION								
ST-1	4/6	1420		X	ST-1A	2x40z	X	X	X	X	X		
ST-1		1425		X	ST-1B		X	X	X	X			
ST-2		1445		X	ST-2A		X	X	X	X	X		
ST-2		1451		X	ST-2B		X	X	X	X			
ST-3		1520		X	ST-3A	1x1L.				X		NaOH pH > 12	
ST-3		1520		X	ST-3A	1x1L.		X	X				
ST-3		1520		X	ST-3A	1x1L.	X						
ST-3		1520		X	ST-3A	6x40ml	X				X		
ST-3		1525		X	ST-3B	2x1L.		X		X		NaOH pH > 12 ON 9010 ANALYSIS	
ST-3		1525		X	ST-3B	1x1L.	X	X					
ST-3		1525		X	ST-3B	4x40ml	X			X		* AS REQUESTED IN CONTRACT w/	
ST-3		1530		X	ST-3C	2x1LIT.		X		X		SOUND LABORATORY	
ST-3		1530		X	ST-3C	1x1L.	X						
ST-3		1530		X	ST-3C	4x40ml	X				X		
TB		1800		X	TB-1-4/6/98	1x40ml	X						
Relinquished by: (Signature)			Date / Time		Received by: (Signature)		Relinquished by: (Signature)			Date / Time		Received by: (Signature)	
			4/7/98 1200		FED-X								
Relinquished by: (Signature)			Date / Time		Received by: (Signature)		Relinquished by: (Signature)			Date / Time		Received by: (Signature)	
Relinquished by: (Signature)			Date / Time		Received for Laboratory by: (Signature)		Date / Time		Remarks				
							4/8/98 930AM		FED-X B/L # 804733300967				

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

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SOUND ANALYTICAL SERVICES, INC.

TOTAL METALS CONTINUED

The relative percent difference (RPD) values for barium, chromium and lead in the duplicate analysis of sample 71868-1 exceeded the quality control limits. The sample was reanalyzed with lead continuing to fall outside of the quality control limit.

The percent difference of cobalt in the serial dilution analysis of sample 71868-1 fell outside of the quality control limits.

The percent recoveries of antimony, mercury and silver in the matrix spike analysis of sample 71868-6 exceeded the quality control limits. The sample was reanalyzed with antimony and silver continuing to fall outside of the control limits. Matrix interference is indicated by the post digest percent recoveries.

All other quality control was within the acceptance limits.

The metals data for the liquid sample matrices is located behind the solid metals data in this package.

$$\frac{\text{Instrument reading} \times \text{final volume} \times \text{dilution factor}}{\text{sample weight or volume} \times \text{dry weight}}$$

CYANIDE

Samples 71868-6, 71868-9, 71868-23, 71868-27 and 71868-30 (liquids) were analyzed for total cyanide in accordance with EPA Method 9010. The samples were prepared and analyzed on 4-20-98.

All quality control was within the acceptance limits.

$$\frac{\text{Instrument reading} \times 50\text{ml (final volume)} \times \text{dilution factor}}{50\text{ml (sample volume)}}$$

ANALYTICAL DATA REVIEW SUMMARY

Site Name: WDI Tank Assessment
Location: Santa Fe Springs, California
PAN No.: 0294-WDSF-XX
TDD No.: 09-9803-0006
Laboratory: Sound Analytical Services, Inc.
Sampling Date: April 6, 1998
Analytical Method: 6010
Sample Matrix: Soil/Water

Sample No.	Sample I.D.	Laboratory I.D.
1	BKG-1	71868-05
2	DW-1	71868-04
3	ST-1A	71868-19
4	ST-1B	71868-20
5	ST-2A	71868-21
6	ST-2B	71868-22
7	ST-4A	71868-01
8	ST-4B	71868-02
9	ST-5	71868-03
10	EB-1	71868-16
11	ST-3A	71868-24
12	ST-3B	71868-27
13	ST-3C	71868-30
14	ST-3D	71868-06
15	ST-3E	71868-09
16	UST-1	71868-12

Data Reviewer: Trisha J. Woolslayer *Trisha J. Woolslayer 5/18/98*
ChemistQA Reviewer: _____
START PM Acceptance: _____

METALS DATA VALIDATION WORKSHEET - SUMMARY

Report No.: 71868
Laboratory: Sound Analytical Services, Inc.
Reviewer: Trisha J. Woolslayer
Review Date: May 12, 1998
Analytical Method: 6010

No. of Samples **Water:** 7 **Solid:** 9 **Other:** _____

Indicate with a YES or NO whether each item is within QC limits.

1.	Holding Times	<u>Y</u>
2.	Matrix Spike/Spike Duplicate	<u>*</u>
3.	Blanks	<u>Y</u>
4.	Initial Calibration	<u>Y</u>
5.	Continuing Calibration	<u>Y</u>
6.	Laboratory Control Sample (LCS)	<u>*</u>
7.	ICP Interference check sample	<u>Y</u>
8.	Compound Quantitation	<u>Y</u>
9.	Method of Standard Addition (MSA)	<u>N/A</u>
10.	ICP Serial Dilution	<u>Y</u>
11.	Quarterly IDLs and ICP Linear Ranges	<u>Y</u>
12.	System Performance	<u>Y</u>
13.	Overall Assessment	<u>*</u>

Note: * = Some data qualified, some problems noted in review.

Other Problems/Comments: _____

METALS AND CYANIDE ANALYSES

DATA PACKAGE COMPLETENESS CHECKLIST

Checklist Code:	<u>X</u>	Included: no problems
	<u>*</u>	Included: problems noted in review
	<u>O</u>	Not Included and/or Not Available
	<u>NR</u>	Not Required
	<u>RS</u>	Provided As Re-submission

X Case Narrative

Quality Control Summary Package

<u>X</u>	Data Summary Sheets (Form I)
<u>X</u>	Initial and Continuing Calibration (Form IIA)
<u>X</u>	CRDL Standard Results (Form IIB)
<u>X</u>	Calibration and Preparation Blank Results (Form III)
<u>X</u>	ICP Interference Check Sample (Form IV)
<u>X</u>	Spike Recovery Results (Form VA)
<u>X</u>	Duplicate Sample Results
<u>X</u>	Laboratory Control Sample Results (Form VII)
<u>N/A</u>	Standard Addition Results (Form VIII)
<u>X</u>	ICP Serial Dilution (Form IX)
<u>X</u>	Instrument Detection Limits: Quarterly (Form X)
<u>X</u>	ICP Interelement Correction Factors (Form XI)
<u>X</u>	ICP Linear Ranges: Quarterly (Form XII)
<u>X</u>	Preparation Log (Form 13)
<u>X</u>	Analysis Run Log (Form 14)

Raw QC Data Package Section

<u>X</u>	Chain-of-Custody Records
<u>X</u>	Quantitation Reports
<u>X</u>	Raw Instrument Printouts
<u>X</u>	Sample Preparation Notebook Pages
<u>X</u>	Logbook and Worksheet Pages
<u>X</u>	Percent Solids Determination

I. HOLDING TIMES

Acceptable X Outside QC Limits

Samples were prepared and analyzed within applicable holding times except as noted under comments. In addition, no problems were identified with regard to sample preservation or custody unless specified. For those sample fractions prepared or analyzed outside holding time requirements, the results have been qualified as estimated (J).

Cyanide	14 Days	Hexavalent Chromium	24 hours
Mercury	28 Days	All Other Metals	6 months

Comments:

No comments.

II. INITIAL AND CONTINUING CALIBRATION VERIFICATION

Acceptable X Outside QC Limits

Except as flagged below, a calibration verification standard and blank were analyzed at the beginning of the analysis and after every tenth sample. For AA methods, ICV recoveries were within the range of 90-110%. Other recoveries were within applicable control limits (Mercury or Tin 80-120%; Other Metals 90-110%; Cyanide 85-115%) unless noted. Calibration QC failures result in qualification of associated data as estimated (J). Any sample results greater than 110% of the highest standard were also flagged "J." Calibration data which is unacceptably out of control (Mercury or Tin <65% or >135%; Other Metals <75% or >125%; Cyanide <70% or >130%) may result in rejection (R) of all associated data.

Comments:

In the continuing calibration associated with the soil samples, Thallium recovery was outside QC limits (R = 87.8%). There were no reported positive results for Thallium. Therefore, no data were qualified.

IIIA. ERROR DETERMINATION

 X Matrix Spike/Spike Duplicate Samples Analyzed
 No Spike Samples Analyzed

Matrix spike samples may be used for a qualitative indication of result bias and precision. Spike recoveries of less than 80% or greater than 120% may be sufficient cause to flag associated data as estimated (J). This is left to the professional judgement of the data validator.

Comments:

The following compounds had spike recoveries associated with the soil samples outside QC limits.

<i>Compound</i>	<i>Spike % Recovery</i>
Lead	50.2% / 18.4%
Zinc	61.5%
Antimony	0.0%
Thallium	69.6% (Post Digestion Spike)

The following compounds had MS/MSD recoveries associated with the water samples outside QC limits.

<i>Compound</i>	<i>Spike % Recovery</i>
Antimony	2418 % / 3274%
Silver	66.5% / 61.0%

III B. METHOD PERFORMANCE

Check whether an aqueous LCS (Blank Spike) was analyzed for every 20 samples or one LCS per batch which ever was greater. Check also that on solid LCS was analyzed at least every month. The LCS recovery should be between 80-120%. If the recovery is 30-79% or >120% all positive data associated with this LCS is qualified as estimated (J). All negative data associated with the standard are also considered estimated (J) if the recovery is between 30-79%. If the LCS result is <30% all associated data are qualified as rejected (R).

Comments:

In the LCS associated with the soil samples, Antimony (%R = 187.9) and Arsenic (%R = 79.8) had recoveries outside QC limits.

In the LCS associated with the water samples, Antimony (%R = 74.7) had recovery outside QC limits.

These data are therefore qualified.

IV. BLANKS AND BACKGROUND SAMPLES

Acceptable X Detection Limits Adjusted

The following blanks were analyzed:

<u> X </u>	Preparation Blanks	<u> </u>	Field Blanks
<u> X </u>	Calibration Blanks		Rinsate Blanks
<u> </u>	Background Samples		

The appropriate blanks were analyzed at the proper frequency except as noted below. Any compound detected in the sample and also detected in any associated blank, must be qualified as non-detect (UJ) when the sample concentration is less than five-times the blank concentration (detection limit was recalculated to be five-times the blank level). If blank contamination is over acceptable levels, data may be rejected (R).

Comments:

The following compounds were reported at levels above the IDL, but below the CRDL in the associated blanks. Based on the CRDL, no data were qualified.

Compound	ICB	CCB	Soil	Water
Antimony	X		X	X
Cadmium	X		X	X
Selenium	X		X	X
Chromium		X	X	
Nickel		X	X	X
Vandium		X	X	X
Copper		X		X

V. ICP/AA RELATED QUALITY CONTROL

Acceptable	<u> X </u>	Accepted with Qualification	<u> </u>
Rejected	<u> </u>		<u> </u>

ICP Analyses

Unless noted below, ICP Interference Check Samples had recoveries inside control limits (80-120%) and were analyzed at the beginning and the end of each run and at least twice every 8 hours. In cases where sample concentrations exceeded 50 times the instrument detection limit (IDL), a serial dilution was performed on one of each 20 samples of a similar matrix. The 5-fold dilution results should agree to within 10% of the original determination. Results which exceed this limit are qualified at the discretion of the reviewer.

Comments:

No comments.

VI. OVERALL ASSESSMENT OF DATA

On the basis of this review, the following determination has been made with regard to the overall data usability for the specified level.

Acceptable	_____	Accepted with Qualification	<u> X </u>
Rejected	_____		_____

Accepted data meet the minimum requirements for the following EPA data category:

ERS Screening	_____
Non-definitive with 10% Conformation by Definitive Methodology	_____
Definitive	<u> X </u>
Without Comprehensive Statistical Error Determination	<u> X </u>
With Comprehensive Statistical error Determination	_____

Any qualifications to individual sample analysis results are detailed in the appropriate section above or appear under the comments section below. In cases where several QC criteria are out of specification, it may be appropriate to further qualify the data usability. The data reviewer must use professional judgment and express concerns and comments on the data validity for each specific data package.

Comments:

- In the continuing calibration associated with the soil samples, Thallium recovery was outside QC limits ($R = 87.8\%$). There were no reported positive results for Thallium. Therefore, no data were qualified.*
- Several compounds were qualified due to spike recoveries outside QC limits.*
- In the LCS associated with the soil samples, Antimony ($\%R = 187.9$) and Arsenic ($\%R = 79.8$) had recoveries outside QC limits. In the LCS associated with the water samples, Antimony ($\%R = 74.7$) had recovery outside QC limits.*
- Several compounds were reported at levels above the IDL, but below the CRDL in associated blanks for both the water and soil samples. Based on the CRDL, no data were qualified.*

ANALYTICAL DATA REVIEW

APPENDIX A

DATA VALIDATION QUALIFIERS

The following list of data validation qualifiers may be used in this data review package:

- J The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or because quality control criteria were not met.
- N Presumptive evidence of presence of material.
- NJ Presumptive evidence of the presence of the material at an estimated quantity.
- U The material was analyzed for, but not detected. The associated numerical value is the sample detection limit or adjusted sample detection limit.
- UJ The material was analyzed for, but not detected. The reported detection limit is estimated because quality control criteria were not met.
- R The sample results are rejected (analyte may or may not be present) due to gross deficiencies in quality control criteria. Any reported value is unusable
- RND Recovery Not Determined (Optional).
- PND Precision Not Determined (Optional).

ANNOTATED DATA SUMMARY SHEETS

Hand-annotated copies of the Data Summary Sheets from the analytical data package follow. When appropriate, detection limits have been adjusted to reflect effects of relevant qualifications noted during the data review. Errors in the reporting of detected compound results will usually not be changed by hand. In these cases, the laboratory may be required to re-submit portions of the data package and any affected Data summary Sheets. Any additional quality control failures have been flagged using the above listed data validation qualifiers.

Pages of Annotated Data summary Sheets follow.

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

ST-4A

Lab Name: SOUND_ANALYTICAL_SERVICES Contract: E&E

Lab Code: SAS Case No.: N/A SAS No.: 71868 SDG No.: ST-4A

Matrix (soil/water): SOIL

Lab Sample ID: 71868-1

Level (low/med): LOW

Date Received: 04/08/98

Solids: 83.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony	20.1	U		P
7440-38-2	Arsenic	17.9	B		P
7440-39-3	Barium	82.7			P
7440-41-7	Beryllium	0.11	B		P
7440-43-9	Cadmium	0.31	U		P
7440-70-2	Calcium				NR
7440-47-3	Chromium	23.3			P
7440-48-4	Cobalt	4.3	B		P
7440-50-8	Copper	24.1			P
7439-89-6	Iron				NR
7439-92-1	Lead	48.9			P
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.09	U		AV
7440-02-0	Nickel	12.0			P
7440-09-7	Potassium				NR
7782-49-2	Selenium	10.1	U		P
7440-22-4	Silver	0.12	U		P
7440-23-5	Sodium				NR
7440-28-0	Thallium	5.8	U		P
7440-62-2	Vanadium	22.7			P
7440-66-6	Zinc	82.4			P
0000-00-0	Molybdenum	1.1	U		P

Color Before: _____

Clarity Before: _____

Texture: _____

Color After: _____

Clarity After: _____

Artifacts: _____

Comments:

INORGANIC ANALYSES DATA SHEET

ST-4B

Name: SOUND_ANALYTICAL_SERVICES Contract: E&E

Lab Code: SAS Case No.: N/A SAS No.: 71868 SDG No.: ST-4A

Matrix (soil/water): SOIL

Lab Sample ID: 71868-2

Level (low/med): LOW

Date Received: 04/08/98

Solids: 79.8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum		-		NR
7440-36-0	Antimony	22.0	U		P
7440-38-2	Arsenic	6.9	B		P
7440-39-3	Barium	111			P
7440-41-7	Beryllium	0.23	B		P
7440-43-9	Cadmium	2.2	B		P
7440-70-2	Calcium				NR
7440-47-3	Chromium	15.8			P
7440-48-4	Cobalt	5.6	B		P
7440-50-8	Copper	20.8			P
7439-89-6	Iron				NR
7439-92-1	Lead	50.0			P
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.20			AV
7440-02-0	Nickel	14.5			P
7440-09-7	Potassium				NR
7782-49-2	Selenium	50.8	B		P
7440-22-4	Silver	0.13	U		P
7440-23-5	Sodium				NR
7440-28-0	Thallium	6.4	U		P
7440-62-2	Vanadium	31.0			P
7440-66-6	Zinc	90.0			P
0000-00-0	Molybdenum	1.2	U		P

5/18/98 (m)

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

INORGANIC ANALYSES DATA SHEET

ST-5

Lab Name: SOUND_ANALYTICAL_SERVICES Contract: E&E

Lab Code: SAS Case No.: N/A SAS No.: 71868 SDG No.: ST-4A

Matrix (soil/water): SOIL

Lab Sample ID: 71868-3

Level (low/med): LOW

Date Received: 04/08/98

Solids: 76.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony	48.5			P
7440-38-2	Arsenic	16.6	B		P
7440-39-3	Barium	232			P
7440-41-7	Beryllium	0.55	B		P
7440-43-9	Cadmium	11.6			P
7440-70-2	Calcium				NR
7440-47-3	Chromium	71.2			P
7440-48-4	Cobalt	15.0			P
7440-50-8	Copper	499			P
7439-89-6	Iron				NR
7439-92-1	Lead	142			P
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.13			AV
7440-02-0	Nickel	58.2			P
7440-09-7	Potassium				NR
7782-49-2	Selenium	10.7	U		P
7440-22-4	Silver	0.13	U		P
7440-23-5	Sodium				NR
7440-28-0	Thallium	6.2	U		P
7440-62-2	Vanadium	42.2			P
7440-66-6	Zinc	9690			P
0000-00-0	Molybdenu	12.0			P

5/18/98

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Comments:

INORGANIC ANALYSES DATA SHEET

BKG-1

Lab Name: SOUND_ANALYTICAL_SERVICES Contract: E&E

Lab Code: SAS Case No.: N/A SAS No.: 71868 SDG No.: ST-4A

Matrix (soil/water): SOIL Lab Sample ID: 71868-5

Level (low/med): LOW Date Received: 04/08/98

Solids: 86.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony	19.6	U		P
7440-38-2	Arsenic	32.4	B		P
7440-39-3	Barium	310			P
7440-41-7	Beryllium	0.40	B		P
7440-43-9	Cadmium	0.58	B		P
7440-70-2	Calcium				NR
7440-47-3	Chromium	34.4			P
7440-48-4	Cobalt	15.1			P
7440-50-8	Copper	32.2			P
7439-89-6	Iron				NR
7439-92-1	Lead	142			P
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.10	B		AV
7440-02-0	Nickel	20.9			P
7440-09-7	Potassium				NR
7782-49-2	Selenium	57.7			P
7440-22-4	Silver	0.12	U		P
7440-23-5	Sodium				NR
7440-28-0	Thallium	5.7	U		P
7440-62-2	Vanadium	40.7			P
7440-66-6	Zinc	151			P
0000-00-0	Molybdenu	3.7	B		P

5/18/98

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

DW-1

Lab Name: SOUND_ANALYTICAL_SERVICES Contract: E&E

Lab Code: SAS Case No.: N/A SAS No.: 71868 SDG No.: ST-4A

Matrix (soil/water): SOIL

Lab Sample ID: 71868-4

Level (low/med): LOW

Date Received: 04/08/98

Solids: 78.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony	24.1			P
7440-38-2	Arsenic	26.2	B		P
7440-39-3	Barium	224			P
7440-41-7	Beryllium	0.44	B		P
7440-43-9	Cadmium	1.6	B		P
7440-70-2	Calcium				NR
7440-47-3	Chromium	52.9			P
7440-48-4	Cobalt	12.6			P
7440-50-8	Copper	43.3			P
7439-89-6	Iron				NR
7439-92-1	Lead	184			P
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.92			AV
7440-02-0	Nickel	19.2			P
7440-09-7	Potassium				NR
7782-49-2	Selenium	11.1	U		P
7440-22-4	Silver	0.13	U		P
7440-23-5	Sodium				NR
7440-28-0	Thallium	6.4	U		P
7440-62-2	Vanadium	40.9			P
7440-66-6	Zinc	157			P
0000-00-0	Molybdenu	2.5	B		P

Color Before: _____

Clarity Before: _____

Texture: _____

Color After: _____

Clarity After: _____

Artifacts: _____

Comments:

INORGANIC ANALYSES DATA SHEET

ST-1A

Lab Name: SOUND_ANALYTICAL_SERVICES Contract: E&E_____

Lab Code: SAS_____ Case No.: N/A_____ SAS No.: 71868_ SDG No.: ST-4A_

Matrix (soil/water): SOIL_

Lab Sample ID: 71868-19

Level (low/med): LOW_

Date Received: 04/08/98

Solids: 88.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum		-		NR
7440-36-0	Antimony	19.3	U		P
7440-38-2	Arsenic	3.1	U		P
7440-39-3	Barium	42.0			P
7440-41-7	Beryllium	0.11	U		P
7440-43-9	Cadmium	0.30	U		P
7440-70-2	Calcium		-		NR
7440-47-3	Chromium	4.7			P
7440-48-4	Cobalt	3.5	B		P
7440-50-8	Copper	11.5			P
7439-89-6	Iron		-		NR
7439-92-1	Lead	7.3	U		P
7439-95-4	Magnesium		-		NR
7439-96-5	Manganese		-		NR
7439-97-6	Mercury	0.09	U		AV
7440-02-0	Nickel	3.3	B		P
7440-09-7	Potassium				NR
7782-49-2	Selenium	9.7	U		P
7440-22-4	Silver	0.12	U		P
7440-23-5	Sodium				NR
7440-28-0	Thallium	5.6	U		P
7440-62-2	Vanadium	11.1			P
7440-66-6	Zinc	22.5			P
0000-00-0	Molybdenu	1.0	U		P

5/18/98
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Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

ST-1B

Name: SOUND_ANALYTICAL_SERVICES Contract: E&E

Lab Code: SAS Case No.: N/A SAS No.: 71868 SDG No.: ST-4A

Matrix (soil/water): SOIL

Lab Sample ID: 71868-20

Level (low/med): LOW

Date Received: 04/08/98

Solids: 86.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum		—		NR
7440-36-0	Antimony	20.3	U		P
7440-38-2	Arsenic	3.3	U		P
7440-39-3	Barium	49.3			P
7440-41-7	Beryllium	0.11	U		P
7440-43-9	Cadmium	0.32	U		P
7440-70-2	Calcium		—		NR
7440-47-3	Chromium	5.5			P
7440-48-4	Cobalt	3.8	B		P
7440-50-8	Copper	11.3			P
7439-89-6	Iron		—		NR
7439-92-1	Lead	10.3			P
7439-95-4	Magnesium		—		NR
7439-96-5	Manganese		—		NR
7439-97-6	Mercury	0.09	U		AV
7440-02-0	Nickel	3.5	B		P
7440-09-7	Potassium		—		NR
7782-49-2	Selenium	10.2	U		P
7440-22-4	Silver	0.12	U		P
7440-23-5	Sodium		—		NR
7440-28-0	Thallium	5.9	U		P
7440-62-2	Vanadium	13.4			P
7440-66-6	Zinc	29.8			P
0000-00-0	Molybdenu	2.2	B		P

5/18/98
(m)

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

ST-2A

Lab Name: SOUND_ANALYTICAL_SERVICES Contract: E&E

Lab Code: SAS Case No.: N/A SAS No.: 71868 SDG No.: ST-4A

Matrix (soil/water): SOIL

Lab Sample ID: 71868-21

Level (low/med): LOW

Date Received: 04/08/98

Solids: 87.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony	20.2	U		P
7440-38-2	Arsenic	3.3	U		P
7440-39-3	Barium	68.7			P
7440-41-7	Beryllium	0.13	B		P
7440-43-9	Cadmium	0.85	B		P
7440-70-2	Calcium				NR
7440-47-3	Chromium	11.2			P
7440-48-4	Cobalt	3.6	B		P
7440-50-8	Copper	16.9			P
7439-89-6	Iron				NR
7439-92-1	Lead	44.4			P
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.08	U		AV
7440-02-0	Nickel	10.5			P
7440-09-7	Potassium				NR
7782-49-2	Selenium	10.1	U		P
7440-22-4	Silver	0.12	U		P
7440-23-5	Sodium				NR
7440-28-0	Thallium	5.8	U		P
7440-62-2	Vanadium	18.4			P
7440-66-6	Zinc	69.5			P
0000-00-0	Molybdenum	1.1	U		P

Color Before: _____

Clarity Before: _____

Texture: _____

Color After: _____

Clarity After: _____

Artifacts: _____

Comments:

INORGANIC ANALYSES DATA SHEET

ST-2B

Lab Name: SOUND_ANALYTICAL_SERVICES Contract: E&E

Lab Code: SAS Case No.: N/A SAS No.: 71868 SDG No.: ST-4A

Matrix (soil/water): SOIL

Lab Sample ID: 71868-22

Level (low/med): LOW

Date Received: 04/08/98

Solids: 77.8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony	21.5	U		P
7440-38-2	Arsenic	3.5	U		P
7440-39-3	Barium	264			P
7440-41-7	Beryllium	0.28	B		P
7440-43-9	Cadmium	2.0	B		P
7440-70-2	Calcium				NR
7440-47-3	Chromium	26.1			P
7440-48-4	Cobalt	12.0			P
7440-50-8	Copper	32.3			P
7439-89-6	Iron				NR
7439-92-1	Lead	359			P
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.19			AV
7440-02-0	Nickel	22.8			P
7440-09-7	Potassium				NR
7782-49-2	Selenium	10.8	U		P
7440-22-4	Silver	0.13	U		P
7440-23-5	Sodium				NR
7440-28-0	Thallium	6.2	U		P
7440-62-2	Vanadium	33.5			P
7440-66-6	Zinc	176			P
0000-00-0	Molybdenum	1.1	U		P

Color Before: _____

Clarity Before: _____

Texture: _____

Color After: _____

Clarity After: _____

Artifacts: _____

Comments:

5/18/98 (w)

U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

ST-3D

Lab Name: SOUND_ANALYTICAL_SERVICES Contract: E&E

Lab Code: SAS Case No.: N/A SAS No.: 71868 SDG No.: ST-3D

Matrix (soil/water): WATER

Lab Sample ID: 71868-6

Level (low/med): LOW

Date Received: 04/08/98

Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum		-		NR
7440-36-0	Antimony	182	U		P
7440-38-2	Arsenic	29.5	U		P
7440-39-3	Barium	39.7			P
7440-41-7	Beryllium	1.0	U		P
7440-43-9	Cadmium	2.8	U		P
7440-70-2	Calcium				NR
7440-47-3	Chromium	9.6	B		P
7440-48-4	Cobalt	1.6	U		P
7440-50-8	Copper	16.6	B		P
7439-89-6	Iron				NR
7439-92-1	Lead	68.7	U		P
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.27			AV
7440-02-0	Nickel	13.1	B		P
7440-09-7	Potassium				NR
7782-49-2	Selenium	91.7	U		P
7440-22-4	Silver	1.1	U		P
7440-23-5	Sodium				NR
7440-28-0	Thallium	52.7	U		P
7440-62-2	Vanadium	25.0	B		P
7440-66-6	Zinc	140			P
0000-00-0	Molybdenu	9.6	U		P

5/18/98 (D)

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

ST-3E

Lab Name: SOUND_ANALYTICAL_SERVICES Contract: E&E

Lab Code: SAS Case No.: N/A SAS No.: 71868 SDG No.: ST-3D

Matrix (soil/water): WATER

Lab Sample ID: 71868-9

Level (low/med): LOW

Date Received: 04/08/98

Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum		-		NR
7440-36-0	Antimony	182	U		P
7440-38-2	Arsenic	29.5	U		P
7440-39-3	Barium	247			P
7440-41-7	Beryllium	1.0	U		P
7440-43-9	Cadmium	2.8	U		P
7440-70-2	Calcium		-		NR
7440-47-3	Chromium	130			P
7440-48-4	Cobalt	2.3	B		P
7440-50-8	Copper	16.8	B		P
7439-89-6	Iron				NR
7439-92-1	Lead	99.2	B		P
7439-95-4	Magnesium		-		NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.17	U		AV
7440-02-0	Nickel	82.9			P
7440-09-7	Potassium				NR
7782-49-2	Selenium	91.7	U		P
7440-22-4	Silver	1.1	U		P
7440-23-5	Sodium				NR
7440-28-0	Thallium	52.7	U		P
7440-62-2	Vanadium	12.8	B		P
7440-66-6	Zinc	250			P
0000-00-0	Molybdenum	9.6	U		P

5/18/98
Ju

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

UST-1

b Name: SOUND_ANALYTICAL_SERVICES Contract: E&E

Lab Code: SAS Case No.: N/A SAS No.: 71868 SDG No.: ST-3D

Matrix (soil/water): WATER

Lab Sample ID: 71868-12

Level (low/med): LOW

Date Received: 04/08/98

Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony	182	U		P
7440-38-2	Arsenic	29.5	U		P
7440-39-3	Barium	135			P
7440-41-7	Beryllium	1.0	U		P
7440-43-9	Cadmium	2.8	U		P
7440-70-2	Calcium				NR
7440-47-3	Chromium	1.0	U		P
7440-48-4	Cobalt	1.6	U		P
7440-50-8	Copper	3.7	B		P
7439-89-6	Iron				NR
7439-92-1	Lead	68.7	U		P
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.17	U		AV
7440-02-0	Nickel	7.8	B		P
7440-09-7	Potassium				NR
7782-49-2	Selenium	91.7	U		P
7440-22-4	Silver	1.1	B		P
7440-23-5	Sodium				NR
7440-28-0	Thallium	52.7	U		P
7440-62-2	Vanadium	16.2	B		P
7440-66-6	Zinc	7.2	B		P
0000-00-0	Molybdenu	10.0	B		P

5/18/98

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

EB-1

Lab Name: SOUND_ANALYTICAL_SERVICES Contract: E&E

Lab Code: SAS Case No.: N/A SAS No.: 71868 SDG No.: ST-3D

Matrix (soil/water): WATER

Lab Sample ID: 71868-16

Level (low/med): LOW

Date Received: 04/08/98

Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony	182	U		P
7440-38-2	Arsenic	29.5	U		P
7440-39-3	Barium	26.8			P
7440-41-7	Beryllium	1.0	U		P
7440-43-9	Cadmium	5.9	B		P
7440-70-2	Calcium				NR
7440-47-3	Chromium	3.0	B		P
7440-48-4	Cobalt	1.6	U		P
7440-50-8	Copper	4.4	B		P
7439-89-6	Iron				NR
7439-92-1	Lead	68.7	U		P
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.17	U		AV
7440-02-0	Nickel	4.7	B		P
7440-09-7	Potassium				NR
7782-49-2	Selenium	91.7	U		P
7440-22-4	Silver	14.7			P
7440-23-5	Sodium				NR
7440-28-0	Thallium	52.7	U		P
7440-62-2	Vanadium	17.3	B		P
7440-66-6	Zinc	12.9	B		P
0000-00-0	Molybdenum	9.6	U		P

5/18/98 (JW)

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

ST-3A

Lab Name: SOUND_ANALYTICAL_SERVICES Contract: E&E

Lab Code: SAS Case No.: N/A SAS No.: 71868 SDG No.: ST-3D

Matrix (soil/water): WATER

Lab Sample ID: 71868-24

Level (low/med): LOW

Date Received: 04/08/98

Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum		-		NR
7440-36-0	Antimony	182	U		P
7440-38-2	Arsenic	48.8	B		P
7440-39-3	Barium	39.7			P
7440-41-7	Beryllium	1.0	U		P
7440-43-9	Cadmium	2.8	U		P
7440-70-2	Calcium				NR
7440-47-3	Chromium	4.7	B		P
7440-48-4	Cobalt	1.6	U		P
7440-50-8	Copper	15.3	B		P
7439-89-6	Iron				NR
7439-92-1	Lead	68.7	U		P
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.17	U		AV
7440-02-0	Nickel	10.6	B		P
7440-09-7	Potassium				NR
7782-49-2	Selenium	292	B		P
7440-22-4	Silver	1.1	U		P
7440-23-5	Sodium				NR
7440-28-0	Thallium	52.7	U		P
7440-62-2	Vanadium	14.8	B		P
7440-66-6	Zinc	120			P
0000-00-0	Molybdenu	9.6	U		P

5/16/98 (20)

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

ST-3B

b Name: SOUND_ANALYTICAL_SERVICES Contract: E&E

Lab Code: SAS Case No.: N/A SAS No.: 71868 SDG No.: ST-3D

Matrix (soil/water): WATER

Lab Sample ID: 71868-27

Level (low/med): LOW

Date Received: 04/08/98

Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony	182	U		P
7440-38-2	Arsenic	29.5	U		P
7440-39-3	Barium	25.2			P
7440-41-7	Beryllium	1.0	U		P
7440-43-9	Cadmium	2.8	U		P
7440-70-2	Calcium				NR
7440-47-3	Chromium	3.5	B		P
7440-48-4	Cobalt	1.6	U		P
7440-50-8	Copper	9.5	B		P
7439-89-6	Iron				NR
7439-92-1	Lead	68.7	U		P
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.17	U		AV
7440-02-0	Nickel	7.4	B		P
7440-09-7	Potassium				NR
7782-49-2	Selenium	91.7	U		P
7440-22-4	Silver	1.1	U		P
7440-23-5	Sodium				NR
7440-28-0	Thallium	52.7	U		P
7440-62-2	Vanadium	13.8	B		P
7440-66-6	Zinc	72.4			P
0000-00-0	Molybdenum	9.6	U		P

5/18/98

Color Before:

Clarity Before:

Texture:

Color After:

Clarity After:

Artifacts:

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

ST-3C

b Name: SOUND_ANALYTICAL_SERVICES Contract: E&E

Lab Code: SAS Case No.: N/A SAS No.: 71868 SDG No.: ST-3D

Matrix (soil/water): WATER

Lab Sample ID: 71868-30

Level (low/med): LOW

Date Received: 04/08/98

Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum		-		NR
7440-36-0	Antimony	182	U		P
7440-38-2	Arsenic	47.5	B		P
7440-39-3	Barium	27.2			P
7440-41-7	Beryllium	1.0	U		P
7440-43-9	Cadmium	2.8	U		P
7440-70-2	Calcium				NR
7440-47-3	Chromium	2.3	B		P
7440-48-4	Cobalt	1.6	U		P
7440-50-8	Copper	10.7	B		P
7439-89-6	Iron				NR
7439-92-1	Lead	68.7	U		P
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.17	U		AV
7440-02-0	Nickel	18.2	B		P
7440-09-7	Potassium				NR
7782-49-2	Selenium	91.7	U		P
7440-22-4	Silver	1.1	U		P
7440-23-5	Sodium				NR
7440-28-0	Thallium	52.7	U		P
7440-62-2	Vanadium	14.5	B		P
7440-66-6	Zinc	71.1			P
0000-00-0	Molybdenum	9.6	U		P

5/18/98

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

71808

CHAIN OF CUSTODY RECORD

PROJ. NO.		PROJECT NAME				NO. OF CON- TAINERS	REMARKS					
SAMPLERS: (Signature)							REMARKS					
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION		REMARKS					
✓ ST-4	4/6	1559		X	ST-4A	2X40m	X	X	X	X	X	
✓ ST-4		1608		X	ST-4B	2X40m	X	X	X	X	X	
✓ ST-5		1630		X	ST-5	2X40m	X	X	X	X	X	
✓ DW-1		1617		X	DW-1	2X40m	X	X	X	X	X	DO MS/MSD IF SUFFICIENT SAMPLE VOLUME
✓ BKG-1		1650		X	BKG-1	2X40m	X	X	X	X	X	
✓ ST-3		1545		X	ST-3D	2X1L			X	X		
✓ ST-3		1545		X	ST-3D	1X1L	X					
✓ ST-3		1545		X	ST-3D	4X40m	X				X	
✓ ST-3		1550		X	ST-3E	2X1L		X		X		
✓ ST-3		1550		X	ST-3E	1X1L	X					
✓ ST-3		1550		X	ST-3E	4X40m	X				X	
✓ UST-1		1635		X	UST-1	1X1L		X				* As requested in contract w/ Sound Laboratory
✓ UST-1		1635		X	UST-1	1X1L	X					
✓ UST-1		1635		X	UST-1	6X40m	X				X	
✓ TB		1800		X	TB-2 - 4/6/98	1X40m	X					
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Relinquished by: (Signature)		Date / Time		Received by: (Signature)		
M. Kluwe		4/7/98 1200		FED-X								
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Relinquished by: (Signature)		Date / Time		Received by: (Signature)		
Relinquished by: (Signature)		Date / Time		Received for Laboratory by: (Signature)		Date / Time		Remarks				
				S. Giana		4/8/98 930AM		FED-X B/L # 804733300967				

[illegible]

71868
CHAIN OF CUSTODY RECORD

COOLERS 2 of 2

REGION 9
75 Hawthorne Street
San Francisco, California 94105

PROJ. NO. KJ9103		PROJECT NAME WDI TANK ASSESSMENT				NO. OF CON- TAINERS	ANALYSIS						REMARKS
SAMPLERS: (Signature) <i>M. Schum</i> <i>Jed Joff</i>							VOCs EPA 8260	pesticides EPA 8080	17 CALIFORNIA METALS	SVOCs EPA 8270	TOTAL CYANIDE EPA 9010B	TPH (gr/L) EPA 8015M	
STA. NO.	DATE 1998	TIME	COMP.	GRAB	STATION LOCATION								
ST-1	4/6	1420		X	ST-1A	2x4oz	X	X	X	X	X		
ST-1		1425		X	ST-1B		X	X	X	X			
ST-2		1445		X	ST-2A		X	X	X	X			
ST-2		1451		X	ST-2B		X	X	X	X			
ST-3		1520		X	ST-3A	1x1L.				X		NaOH pH > 12	
ST-3		1520		X	ST-3A	1x1L.			X				
ST-3		1520		X	ST-3A	1x1L.		X					
ST-3		1520		X	ST-3A	6x40ml	X				X		
ST-3		1525		X	ST-3B	2x1L.			X		X	NaOH pH > 12 ON 9010 ANALYSIS	
ST-3		1525		X	ST-3B	1x1L.		X					
ST-3		1525		X	ST-3B	4x40ml	X				X	* AS REQUESTED IN CONTRACT W/ SOUND LABORATORY	
ST-3		1530		X	ST-3C	2x1LIT.		X		X			
ST-3		1530		X	ST-3C	1x1L.		X					
ST-3		1530		X	ST-3C	4x40ml	X				X		
TB		1800		X	TB-1-4/6/98	1x40ml	X						

Relinquished by: (Signature) <i>M. Schum</i>	Date / Time 4/7/98 1200	Received by: (Signature) FED-X	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) <i>S. Siano</i>	Date / Time 4/8/98 930AM	Remarks FED-X B/L # 804733300967	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

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SOUND ANALYTICAL SERVICES, INC.

Client: Ecology & Environment, Inc.

Date: April 28, 1998

Project: KJ9103 WDI Tank Assessment

Lab No.: 71868

GASOLINE RANGE ORGANICS

Samples 71868-1, 71868-4 through 71868-5, 71868-19 and 71868-21 (soils) and 71868-8, 71868-11, 71868-14, 71868-18, 71868-26, 71868-29 and 71868-32 (liquids) were analyzed for gasoline range organics in accordance with EPA Method 8015 Modified. The soil sample were extracted on 4-16-98 and analyzed on 4-17-98. The liquid samples were prepared on 4-16-98 and analyzed on 4-17-98.

Sample 71868-14 was received with a pH of 6. Sample 71868-18 was received with a pH of 5.

All quality control was within the acceptance limits.

Waters
quant value x dilution factor

Soils
$$\frac{\text{quant. Value} \times \text{dilution factor} \times 10 \times 40}{\text{sample weight} \times \text{percent solids}}$$

DIESEL RANGE ORGANICS

Samples 71868-1, 71868-3 through 71868-5, 71868-19 and 71868-21 (soils) were analyzed for diesel range organics in accordance with EPA Method 8015 Modified. Several liquid samples were noted on the chain of custody for diesel range organic analysis. Insufficient sample volume was submitted for the liquid analysis and therefor canceled. The soil samples were extracted on 4-20-98 and analyzed on 4-21-98.

The contaminant present in samples 71868-1, 71868-4, 71868-5 and 71868-21 did not appear to be typical diesel range product. The elution pattern suggests that it may be heavy oil.

The contaminant present in sample 71868-3 did not appear to be typical diesel range product.

All quality control was within the acceptance limits.

$$\frac{\text{Instrument reading} \times \text{final volume} \times \text{dilution factor}}{\text{sample weight or volume} \times \text{dry weight}}$$

TOTAL METALS

Samples 71868-1 through 71868-5, and 71868-19 through 71868-22 (soils) and 71868-6, 71868-9, 71868-12, 71868-16, 71868-24, 71868-27 and 71868-30 (liquids) were analyzed for CA metals in accordance with EPA Methods 7470/7471/6010. The soil samples were digested on 4-9-98 and 4-13-98 and analyzed on 4-10-98 and 4-13-98. The liquid samples were digested and analyzed on 4-10-98.

The percent recoveries of antimony, lead and zinc in the matrix spike analyses of sample 71868-1 exceeded the control limits. The sample was reanalyzed with similar results. Matrix interference is indicated by the post digest spike percent recoveries.

SOUND ANALYTICAL SERVICES, INC.

TOTAL METALS CONTINUED

The relative percent difference (RPD) values for barium, chromium and lead in the duplicate analysis of sample 71868-1 exceeded the quality control limits. The sample was reanalyzed with lead continuing to fall outside of the quality control limit.

The percent difference of cobalt in the serial dilution analysis of sample 71868-1 fell outside of the quality control limits.

The percent recoveries of antimony, mercury and silver in the matrix spike analysis of sample 71868-6 exceeded the quality control limits. The sample was reanalyzed with antimony and silver continuing to fall outside of the control limits. Matrix interference is indicated by the post digest percent recoveries.

All other quality control was within the acceptance limits.

The metals data for the liquid sample matrices is located behind the solid metals data in this package.

$$\frac{\text{Instrument reading} \times \text{final volume} \times \text{dilution factor}}{\text{sample weight or volume} \times \text{dry weight}}$$

CYANIDE

Samples 71868-6, 71868-9, 71868-23, 71868-27 and 71868-30 (liquids) were analyzed for total cyanide in accordance with EPA Method 9010. The samples were prepared and analyzed on 4-20-98.

All quality control was within the acceptance limits.

$$\frac{\text{Instrument reading} \times 50\text{ml (final volume)} \times \text{dilution factor}}{50\text{ml (sample volume)}}$$

ANALYTICAL DATA REVIEW SUMMARY

Site Name: WDI Tank Assessment
Location: Santa Fe Springs, California
PAN No.: 0294-WDSF-XX
TDD No.: 09-9803-0006
Laboratory: Sound Analytical Services, Inc.
Sampling Date: April 6, 1998
Analytical Method: 8270
Sample Matrix: soil

Sample No.	Sample I.D.	Laboratory I.D.
1	ST-4A	71868-01
2	ST-4B	71868-02
3	ST-5	71868-03
4	DW-1	71868-04
5	BKG-1	71868-05
6	ST-1A	71868-19
7	ST-1B	71868-20
8	ST-2A	71868-21
9	ST-2B	71868-22

Data Reviewer: Trisha J. Woolslayer *Trisha J. Woolslayer 5/18/98*
Chemist QA Reviewer: _____
START PM Acceptance: _____

GC/MS METHODS DATA VALIDATION WORKSHEET – SUMMARY

Report No.: 71868
Laboratory: Sound Analytical Services, Inc.
Reviewer: Trisha J. Woolslayer
Review Date: May 13, 1998
Analytical Method: 8270

No. of Samples ____ **Water:** ____ **Solid:** 9 **Other:** ____

Indicate with a YES or NO whether each item is within QC limits.

1.	Holding Times	<u>Y</u>
2.	Surrogate Recovery	<u>Y</u>
3.	Matrix Spike/Spike Duplicate	<u>*</u>
4.	Blanks	<u>Y</u>
5.	Initial Calibration	<u>*</u>
6.	Continuing Calibration	<u>Y</u>
7.	Internal Standards	<u>Y</u>
8.	GC/MS Tune Performance	<u>Y</u>
9.	Compound Identification	<u>Y</u>
10.	Compound Quantitation	<u>Y</u>
11.	TIC Identification	<u>Y</u>
12.	System Performance	<u>Y</u>
13.	Overall Assessment	<u>*</u>

Other Problems/Comments: The sample matrix and types of preservatives used were not reported on the chain-of-custody. No data for duplicates were provided. CLP Summary forms were not provided. Therefore, data was validated based on the raw data package.

GC/MS VOLATILE AND SEMI-VOLATILE ANALYSES

DATA PACKAGE COMPLETENESS CHECKLIST

Checklist Code: X Included: no problems
 * Included: problems noted in review
 O Not Included and/or Not Available
 NR Not Required
 RS Provided As Re-submission

 X Case Narrative

Quality Control Summary Package

 X Data Summary Sheets (Form I)
 X Surrogate Recovery Summary (Form II)
 X Matrix Spike/Spike Duplicate Recoveries (Form III)
 X Method Blank Summaries (Form IV)
 X GC/MS Tuning and Mass Calibration (Form V)
 X Initial Calibration Data (Form VI)
 X Continuing Calibration Data (Form VII)
 X Internal Standard Area Summary (Form VIII)
6/3/98

Sample and Blank Data Package Section

 X Reconstructed Ion Current (RIC) Chromatogram
 X Quantitation Reports
 X Quantitation Diagnostic Reports
 X Raw and Enhanced Mass Spectra
 X Reference Mass Spectra for Target Compounds
 X EPA/NIH Mass Spectral Library Search for TICs

Raw QC Data Package Section

 X DFTPP and/or BFB mass spectra and mass listings
 X RIC Chromatogram for Standards and MS/MSD Samples
 X Quantitation Reports for Standards and MS/MSD
 O List of Instrument Detection Limits
 X Chain-of-Custody Records
 X Sample Preparation and Analysis Run Logs
 X Other (i.e. calculation examples)

I. HOLDING TIMES

Acceptable X Outside QC Limits

Samples were prepared and analyzed within required holding times except as noted under Comments. In addition, no problems were identified with regard to sample preservation or custody unless specified. For those sample fractions prepared or analyzed outside holding time requirements, the results have been qualified as estimated (J).

Water Samples:

VOA - 7 days for analysis
BNA - 7 days for extraction, 40 days for analysis

Soil or Other Matrices:

VOA - 14 days for analysis
BNA - 14 days for extraction, 40 days for analysis

Comments:

No comments.

II. GC/MS TUNING CRITERIA

Acceptable X Outside QC Limits

Unless noted below, GC/MS Tuning Compounds (BFB for VOA; DFTPP for BNA) have been analyzed every 12 hours and met ion abundance requirements. (See SW846 Method 8260 p. 34 for VOA criteria and Method 8270 p. 31 for BNA requirements.)

Comments:

No comments.

III. INITIAL AND CONTINUING CALIBRATIONS

Acceptable _____ Outside QC Limits X

The Relative Response Factor (RRF) data were reviewed for the initial and continuing calibrations. Unless flagged below, a 5-point initial calibration was run, and continuing calibrations were performed at the beginning and at the end of any group of samples and at least every 12 hours. In addition, average RRF, Percent relative Standard Deviation (%RSD) and Percent Difference (%D) values were within control limits (aver. RRF ≥ 0.05 ; %RSD ≤ 30 ; %D ≤ 25). or analytes which exceeded these control limits, associated data are qualified as estimated (J). In cases where the low calibration level was not detected, the detection limit is qualified (UJ). In cases where the analyte was not detected in the calibration, all associated data are rejected (R).

Comments:

3,3'-dichlorobenzidine had a RSD of 34.2% in the initial calibration (lab pg. 587). However, no positive results for this compound were reported, and no data are qualified.

IV. ERROR DETERMINATION

 X Matrix Spike/Spike Duplicate Samples Analyzed
 No Spike Samples Analyzed

Matrix spike samples are used for a qualitative indication of result bias and precision. Spike recoveries of less than 80% or greater than 120% may be sufficient cause to flag associated data as estimated (J) if the validator believes that the deviation is not due to matrix effects. Recoveries may also be compared with control limits established for the individual compounds (Appendix B).

Comments:

The following compounds were outside QC limits in the MS and/or MSD.

<i>Compound</i>	<i>MS %Recovery</i>	<i>MSD % Recovery</i>
4-nitrophenol	71.6	65.8
Pentachlorophenol	46.8	47.6
2,4-Dinitrotoulene	*	73.4

*Note: * = within QC limits*

No positive results were reported for the above named compounds. Therefore, no data are qualified.

V. BLANKS AND BACKGROUND SAMPLES

Acceptable X Detection Limits Adjusted

The following blanks were analyzed:

<u> X </u>	Preparation Blanks	<u> </u>	Field Blanks
<u> </u>	Instrument Blanks	<u> </u>	Rinsate Blanks
<u> X </u>	Background Samples	<u> </u>	VOA Trip Blanks

Preparation (method) blanks were prepared for each batch of samples extracted. A preparation or instrument blank was analyzed after every continuing calibration standard, prior to sample analysis unless noted below. In addition, instrument blanks were analyzed after high concentration volatiles samples. Any compound detected in the sample and also detected in any associated blank, must be qualified as non-detect (U) when the sample concentration is less than 5x the blank concentration.

Comments:

No comments.

VI. INTERNAL STANDARD AREAS

Acceptable X Outside QC Limits

Internal Standard areas for samples analyzed within a sample group must be within the range of -50% to +100% of the internal standard area for the continuing calibration. If the internal standard area is between 10% and 50% of this value, the associated results are qualified as estimated (J) and the detection limits are qualified as estimated (UJ). If the internal standard area is <10% of the calibration area, both the associated results and detection limits are rejected (R). If the internal standard area is > 100% of the calibration area, the associated results are qualified as estimated (J). For lists of analytes associated with a particular internal standard see SW 846 Method 8260 p.37 for VOA, or Method 8270 p. 33 for BNAs. Internal standards which exceeded these limits are noted below and the associated analytes are qualified on the attached sample report forms.

Comments:

No comments.

VII. SURROGATE RECOVERIES

Acceptable X Outside QC Limits

Surrogate recoveries should be checked against the guidance values listed in SW846 (VOAs: 8260-42, BNAs: 8270-38). List those recoveries which exceed these ranges below. Analytes associated with these surrogates are considered estimated (J).

Comments:

No comments.

VIII. DUPLICATE ANALYSES

Acceptable _____ Outside QC Limits _____ *

Type of duplicates analyzed:

Field Duplicate _____
Laboratory Duplicate _____

Calculate the relative Percent Difference (RPD) between the members of duplicate pairs using the following equation:

$$RPD = \frac{2(\text{Value 1} - \text{Value 2})}{\text{Value 1} + \text{Value 2}} \times 100\%$$

Qualify the results as estimated (J) for any analyte whose RPD exceeds that specified in the Sampling Plan.

Comments:

No data for duplicates was provided.

IX. ANALYTE IDENTIFICATION

Evaluate the ion profiles for the sample analytes and compare them to the library ion profiles provided by the laboratory. Note any identifications which are not sufficiently supported by comparison to known ion profiles.

Comments:

No comments.

X. ANALYTE QUANTITATION/DETECTION LIMITS

Confirm that analyte quantitation was performed correctly using the following formula:

$$\text{sample concentration} = \frac{(\text{analyte area})(\text{concentration of I.S.})}{(\text{area of I.S.})(\text{RRF})}$$

where I.S. is the internal standard.

Calculate the quantitation limit from the concentration of the lowest standard. All results reported below this limit are qualified as presumptively present at an estimated quantity (NJ) and noted on the attached sample data sheets.

Comments:

No comments.

XI. TIC EVALUATION

Evaluate all tentatively identified compounds (TICs). Confirm that TICs are reported only as a class of compounds and that they are qualified as presumptively present at an estimated concentration.

Comments:

No comments.

XII. OVERALL ASSESSMENT OF GENERAL ANALYTICAL DATA

On the basis of this review, the following determination has been made with regard to the overall data usability for the specified level.

Acceptable	<u>X</u>	Accepted with Qualification	<u> </u>
Rejected	<u> </u>		<u> </u>

Accepted data meet the minimum requirements for the following EPA data category:

ERS Screening	<u> </u>
Non-definitive with 10% Conformation by Definitive Methodology	<u> </u>
Definitive	<u>X</u>
Without Comprehensive Statistical Error Determination	<u>X</u>
With Comprehensive Statistical error Determination	<u> </u>

Any qualifications to individual sample analysis results are detailed in the appropriate section above or appear under the comments section below. In cases where several QC criteria are out of specification, it may be appropriate to further qualify the data usability. The data reviewer must use professional judgment and express concerns and comments on the data validity for each specific data package.

Comments:

- The sample matrix and types of preservatives used were not reported on the chain-of-custody.*
- CLP Summary forms were not provided. Therefore, data was validated based on the raw data package.*
- No data for duplicates was provided.*
- 3,3'-dichlorobenzidine had a RSD of 34.2% in the initial calibration (lab pg. 587). However, no positive results for this compound were reported, and no data were qualified.*
- No positive results were reported for the compounds outside QC limits in the MS/MSD. Therefore, no data were qualified.*

ANALYTICAL DATA REVIEW

APPENDIX A

DATA VALIDATION QUALIFIERS

The following list of data validation qualifiers may be used in this data review package:

- | | |
|------------|--|
| J | The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or because quality control criteria were not met. |
| N | Presumptive evidence of presence of material. |
| NJ | Presumptive evidence of the presence of the material at an estimated quantity. |
| U | The material was analyzed for, but not detected. The associated numerical value is the sample detection limit or adjusted sample detection limit. |
| UJ | The material was analyzed for, but not detected. The reported detection limit is estimated because quality control criteria were not met. |
| R | The sample results are rejected (analyte may or may not be present) due to gross deficiencies in quality control criteria. Any reported value is unusable |
| RND | Recovery Not Determined (Optional). |
| PND | Precision Not Determined (Optional). |

ANNOTATED DATA SUMMARY SHEETS

Hand-annotated copies of the Data Summary Sheets from the analytical data package follow. When appropriate, detection limits have been adjusted to reflect effects of relevant qualifications noted during the data review. Errors in the reporting of detected compound results will usually not be changed by hand. In these cases, the laboratory may be required to re-submit portions of the data package and any affected Data summary Sheets. Any additional quality control failures have been flagged using the above listed data validation qualifiers.

Pages of Annotated Data summary Sheets follow.

SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-4A
Lab ID:	71868-01
Date Received:	4/8/98
Date Prepared:	4/10/98
Date Analyzed:	4/10/98
% Solids	83.54

Semivolatile Organics by USEPA Method 8270

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Nitrobenzene - d5	72		23	120
2 - Fluorobiphenyl	78		30	115
p - Terphenyl - d14	72		18	137
Phenol - d5	76		24	113
2 - Fluorophenol	66		25	121
2,4,6 - Tribromophenol	54		19	122

Sample results are on a dry weight basis.

Analyte	Result (ug/kg)	PQL	Flags
Phenol	180	590	J
bis(2-Chloroethyl)ether	ND	590	
2-Chlorophenol	ND	590	
1,3-Dichlorobenzene	ND	590	
1,4-Dichlorobenzene	ND	590	
Benzyl Alcohol	ND	590	
1,2-Dichlorobenzene	ND	590	
2-Methylphenol	ND	590	
bis(2-Chloroisopropyl)ether	ND	590	
3- & 4-Methylphenol	ND	590	
N-nitroso-di-n-propylamine	ND	590	
Hexachloroethane	ND	590	
Nitrobenzene	ND	590	
Isophorone	ND	590	
2-Nitrophenol	ND	590	
2,4-Dimethylphenol	ND	590	
Benzoic Acid	ND	590	
bis(2-Chloroethoxy)methane	ND	590	
2,4-Dichlorophenol	ND	590	
1,2,4-Trichlorobenzene	ND	590	
Naphthalene	ND	120	
4-Chloroaniline	ND	590	
Hexachlorobutadiene	ND	590	
4-Chloro-3-methylphenol	ND	590	
2-Methylnaphthalene	320	120	
Hexachlorocyclopentadiene	ND	590	

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SOUND ANALYTICAL SERVICES, INC.

Semivolatile Organics by USEPA Method 8270 data for 71868-01 continued...

Analyte	Result (ug/kg)	PQL	Flags
2,4,6-Trichlorophenol	ND	590	
2,4,5-Trichlorophenol	ND	590	
2-Chloronaphthalene	ND	120	
2-Nitroaniline	ND	590	
Dimethylphthalate	ND	590	
Acenaphthylene	ND	120	
2,6-Dinitrotoluene	ND	590	
3-Nitroaniline	ND	590	
Acenaphthene	ND	120	
2,4-Dinitrophenol	ND	590	
4-Nitrophenol	ND	590	
Dibenzofuran	ND	590	
2,4-Dinitrotoluene	ND	590	
Diethylphthalate	ND	590	
4-Chlorophenylphenylether	ND	590	
Fluorene	ND	120	
4-Nitroaniline	ND	590	
4,6-Dinitro-2-methylphenol	ND	590	
N-Nitrosodiphenylamine	ND	590	
4-Bromophenylphenylether	ND	590	
Hexachlorobenzene	ND	590	
Pentachlorophenol	ND	590	
Phenanthrene	810	120	
Anthracene	ND	120	
Di-n-butylphthalate	ND	590	
Fluoranthene	1000	120	
Pyrene	950	120	
Butylbenzylphthalate	ND	590	
3,3'-dichlorobenzidine	ND	590	
Benzo(a)anthracene	440	120	
Chrysene	580	120	
bis(2-Ethylhexyl)phthalate	510	590	J
Di-n-octylphthalate	ND	590	
Benzo(b)fluoranthene	630	120	
Benzo(k)fluoranthene	180	120	
Benzo(a)pyrene	490	120	
Indeno(1,2,3-cd)pyrene	ND	120	
Dibenz(a,h)anthracene	ND	120	
Benzo(g,h,i)perylene	ND	120	

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SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-4B
Lab ID:	71868-02
Date Received:	4/8/98
Date Prepared:	4/10/98
Date Analyzed:	4/10/98
% Solids	79.84

Semivolatile Organics by USEPA Method 8270

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Nitrobenzene - d5	88		23	120
2 - Fluorobiphenyl	75		30	115
p - Terphenyl - d14	73		18	137
Phenol - d5	78		24	113
2 - Fluorophenol	90		25	121
2,4,6 - Tribromophenol	89		19	122

Sample results are on a dry weight basis.

Analyte	Result (ug/kg)	PQL	Flags
Phenol	ND	590	
bis(2-Chloroethyl)ether	ND	590	
2-Chlorophenol	ND	590	
1,3-Dichlorobenzene	ND	590	
1,4-Dichlorobenzene	ND	590	
Benzyl Alcohol	ND	590	
1,2-Dichlorobenzene	ND	590	
2-Methylphenol	ND	590	
bis(2-Chloroisopropyl)ether	ND	590	
3- & 4-Methylphenol	ND	590	
N-nitroso-di-n-propylamine	ND	590	
Hexachloroethane	ND	590	
Nitrobenzene	ND	590	
Isophorone	ND	590	
2-Nitrophenol	ND	590	
2,4-Dimethylphenol	ND	590	
Benzoic Acid	ND	590	
bis(2-Chloroethoxy)methane	ND	590	
2,4-Dichlorophenol	ND	590	
1,2,4-Trichlorobenzene	ND	590	
Naphthalene	ND	120	
4-Chloroaniline	ND	590	
Hexachlorobutadiene	ND	590	
4-Chloro-3-methylphenol	ND	590	
2-Methylnaphthalene	ND	120	
Hexachlorocyclopentadiene	ND	590	

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Semivolatile Organics by USEPA Method 8270 data for 71868-02 continued...

Analyte	Result (ug/kg)	PQL	Flags
2,4,6-Trichlorophenol	ND	590	
2,4,5-Trichlorophenol	ND	590	
2-Chloronaphthalene	ND	120	
2-Nitroaniline	ND	590	
Dimethylphthalate	ND	590	
Acenaphthylene	ND	120	
2,6-Dinitrotoluene	ND	590	
3-Nitroaniline	ND	590	
Acenaphthene	ND	120	
2,4-Dinitrophenol	ND	590	
4-Nitrophenol	ND	590	
Dibenzofuran	ND	590	
2,4-Dinitrotoluene	ND	590	
Diethylphthalate	ND	590	
4-Chlorophenylphenylether	ND	590	
Fluorene	ND	120	
4-Nitroaniline	ND	590	
4,6-Dinitro-2-methylphenol	ND	590	
N-Nitrosodiphenylamine	ND	590	
4-Bromophenylphenylether	ND	590	
Hexachlorobenzene	ND	590	
Pentachlorophenol	ND	590	
Phenanthrene	1300	120	
Anthracene	ND	120	
Di-n-butylphthalate	ND	590	
Fluoranthene	1600	120	
Pyrene	1800	120	
Butylbenzylphthalate	ND	590	
3,3'-dichlorobenzidine	ND	590	
Benzo(a)anthracene	450	120	
Chrysene	790	120	
bis(2-Ethylhexyl)phthalate	200	590	J
Di-n-octylphthalate	ND	590	
Benzo(b)fluoranthene	690	120	
Benzo(k)fluoranthene	150	120	
Benzo(a)pyrene	600	120	
Indeno(1,2,3-cd)pyrene	ND	120	
Dibenz(a,h)anthracene	ND	120	
Benzo(g,h,i)perylene	330	120	

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SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-5
Lab ID:	71868-03
Date Received:	4/8/98
Date Prepared:	4/10/98
Date Analyzed:	4/10/98
% Solids	76.18

Semivolatile Organics by USEPA Method 8270

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Nitrobenzene - d5	79		23	120
2 - Fluorobiphenyl	60		30	115
p - Terphenyl - d14	59		18	137
Phenol - d5	95		24	113
2 - Fluorophenol	93		25	121
2,4,6 - Tribromophenol	84		19	122

Sample results are on a dry weight basis.

Analyte	Result (ug/kg)	PQL	Flags
Phenol	ND	130	
bis(2-Chloroethyl)ether	ND	130	
2-Chlorophenol	ND	130	
1,3-Dichlorobenzene	ND	130	
1,4-Dichlorobenzene	ND	130	
Benzyl Alcohol	ND	130	
1,2-Dichlorobenzene	ND	130	
2-Methylphenol	ND	130	
bis(2-Chloroisopropyl)ether	ND	130	
3- & 4-Methylphenol	ND	130	
N-nitroso-di-n-propylamine	ND	130	
Hexachloroethane	ND	130	
Nitrobenzene	ND	130	
Isophorone	ND	130	
2-Nitrophenol	ND	130	
2,4-Dimethylphenol	ND	130	
Benzoic Acid	ND	130	
bis(2-Chloroethoxy)methane	ND	130	
2,4-Dichlorophenol	ND	130	
1,2,4-Trichlorobenzene	ND	130	
Naphthalene	ND	26	
4-Chloroaniline	ND	130	
Hexachlorobutadiene	ND	130	
4-Chloro-3-methylphenol	ND	130	
2-Methylnaphthalene	ND	26	
Hexachlorocyclopentadiene	ND	130	

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SOUND ANALYTICAL SERVICES, INC.

Semivolatile Organics by USEPA Method 8270 data for 71868-03 continued...

Analyte	Result (ug/kg)	PQL	Flags
2,4,6-Trichlorophenol	ND	130	
2,4,5-Trichlorophenol	ND	130	
2-Chloronaphthalene	ND	26	
2-Nitroaniline	ND	130	
Dimethylphthalate	ND	130	
Acenaphthylene	ND	26	
2,6-Dinitrotoluene	ND	130	
3-Nitroaniline	ND	130	
Acenaphthene	ND	26	
2,4-Dinitrophenol	ND	130	
4-Nitrophenol	ND	130	
Dibenzofuran	ND	130	
2,4-Dinitrotoluene	ND	130	
Diethylphthalate	ND	130	
4-Chlorophenylphenylether	ND	130	
Fluorene	ND	26	
4-Nitroaniline	ND	130	
4,6-Dinitro-2-methylphenol	ND	130	
N-Nitrosodiphenylamine	ND	130	
4-Bromophenylphenylether	ND	130	
Hexachlorobenzene	ND	130	
Pentachlorophenol	ND	130	
Phenanthrene	120	26	
Anthracene	ND	26	
Di-n-butylphthalate	54	130	J
Fluoranthene	390	26	
Pyrene	340	26	
Butylbenzylphthalate	140	130	
3,3'-dichlorobenzidine	ND	130	
Benzo(a)anthracene	220	26	
Chrysene	180	26	
bis(2-Ethylhexyl)phthalate	290	130	
Di-n-octylphthalate	ND	130	
Benzo(b)fluoranthene	250	26	
Benzo(k)fluoranthene	88	26	
Benzo(a)pyrene	220	26	
Indeno(1,2,3-cd)pyrene	110	26	
Dibenz(a,h)anthracene	ND	26	
Benzo(g,h,i)perylene	120	26	

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SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	DW-1
Lab ID:	71868-04
Date Received:	4/8/98
Date Prepared:	4/10/98
Date Analyzed:	4/10/98
% Solids	78.68

Semivolatile Organics by USEPA Method 8270

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Nitrobenzene - d5	77		23	120
2 - Fluorobiphenyl	71		30	115
p - Terphenyl - d14	59		18	137
Phenol - d5	107		24	113
2 - Fluorophenol	106		25	121
2,4,6 - Tribromophenol	89		19	122

Sample results are on a dry weight basis.

Analyte	Result (ug/kg)	PQL	Flags
Phenol	ND	130	
bis(2-Chloroethyl)ether	ND	130	
2-Chlorophenol	ND	130	
1,3-Dichlorobenzene	ND	130	
1,4-Dichlorobenzene	ND	130	
Benzyl Alcohol	ND	130	
1,2-Dichlorobenzene	ND	130	
2-Methylphenol	ND	130	
bis(2-Chloroisopropyl)ether	ND	130	
3- & 4-Methylphenol	ND	130	
N-nitroso-di-n-propylamine	ND	130	
Hexachloroethane	ND	130	
Nitrobenzene	ND	130	
Isophorone	ND	130	
2-Nitrophenol	ND	130	
2,4-Dimethylphenol	ND	130	
Benzoic Acid	ND	130	
bis(2-Chloroethoxy)methane	ND	130	
2,4-Dichlorophenol	ND	130	
1,2,4-Trichlorobenzene	ND	130	
Naphthalene	ND	25	
4-Chloroaniline	ND	130	
Hexachlorobutadiene	ND	130	
4-Chloro-3-methylphenol	ND	130	
2-Methylnaphthalene	ND	25	
Hexachlorocyclopentadiene	ND	130	

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SOUND ANALYTICAL SERVICES, INC.

Semivolatile Organics by USEPA Method 8270 data for 71868-04 continued...

Analyte	Result (ug/kg)	PQL	Flags
2,4,6-Trichlorophenol	ND	130	
2,4,5-Trichlorophenol	ND	130	
2-Chloronaphthalene	ND	25	
2-Nitroaniline	ND	130	
Dimethylphthalate	ND	130	
Acenaphthylene	ND	25	
2,6-Dinitrotoluene	ND	130	
3-Nitroaniline	ND	130	
Acenaphthene	ND	25	
2,4-Dinitrophenol	ND	130	
4-Nitrophenol	ND	130	
Dibenzofuran	ND	130	
2,4-Dinitrotoluene	ND	130	
Diethylphthalate	ND	130	
4-Chlorophenylphenylether	ND	130	
Fluorene	ND	25	
4-Nitroaniline	ND	130	
4,6-Dinitro-2-methylphenol	ND	130	
N-Nitrosodiphenylamine	ND	130	
4-Bromophenylphenylether	ND	130	
Hexachlorobenzene	ND	130	
Pentachlorophenol	ND	130	
Phenanthrene	ND	25	
Anthracene	ND	25	
Di-n-butylphthalate	ND	130	
Fluoranthene	38	25	
Pyrene	ND	25	
Butylbenzylphthalate	ND	130	
3,3'-dichlorobenzidine	ND	130	
Benzo(a)anthracene	ND	25	
Chrysene	ND	25	
bis(2-Ethylhexyl)phthalate	240	130	
Di-n-octylphthalate	ND	130	
Benzo(b)fluoranthene	ND	25	
Benzo(k)fluoranthene	ND	25	
Benzo(a)pyrene	ND	25	
Indeno(1,2,3-cd)pyrene	ND	25	
Dibenz(a,h)anthracene	ND	25	
Benzo(g,h,i)perylene	ND	25	

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SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	BKG-1
Lab ID:	71868-05
Date Received:	4/8/98
Date Prepared:	4/10/98
Date Analyzed:	4/10/98
% Solids	86.3

Semivolatile Organics by USEPA Method 8270

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Nitrobenzene - d5	79		23	120
2 - Fluorobiphenyl	81		30	115
p - Terphenyl - d14	63		18	137
Phenol - d5	93		24	113
2 - Fluorophenol	99		25	121
2,4,6 - Tribromophenol	92		19	122

Sample results are on a dry weight basis.

Analyte	Result (ug/kg)	PQL	Flags
Phenol	ND	110	
bis(2-Chloroethyl)ether	ND	110	
2-Chlorophenol	ND	110	
1,3-Dichlorobenzene	ND	110	
1,4-Dichlorobenzene	ND	110	
Benzyl Alcohol	ND	110	
1,2-Dichlorobenzene	ND	110	
2-Methylphenol	ND	110	
bis(2-Chloroisopropyl)ether	ND	110	
3- & 4-Methylphenol	ND	110	
N-nitroso-di-n-propylamine	ND	110	
Hexachloroethane	ND	110	
Nitrobenzene	ND	110	
Isophorone	ND	110	
2-Nitrophenol	ND	110	
2,4-Dimethylphenol	ND	110	
Benzoic Acid	ND	110	
bis(2-Chloroethoxy)methane	ND	110	
2,4-Dichlorophenol	ND	110	
1,2,4-Trichlorobenzene	ND	110	
Naphthalene	ND	23	
4-Chloroaniline	ND	110	
Hexachlorobutadiene	ND	110	
4-Chloro-3-methylphenol	ND	110	
2-Methylnaphthalene	ND	23	
Hexachlorocyclopentadiene	ND	110	

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SOUND ANALYTICAL SERVICES, INC.

Semivolatile Organics by USEPA Method 8270 data for 71868-05 continued...

Analyte	Result (ug/kg)	PQL	Flags
2,4,6-Trichlorophenol	ND	110	
2,4,5-Trichlorophenol	ND	110	
2-Chloronaphthalene	ND	23	
2-Nitroaniline	ND	110	
Dimethylphthalate	ND	110	
Acenaphthylene	ND	23	
2,6-Dinitrotoluene	ND	110	
3-Nitroaniline	ND	110	
Acenaphthene	ND	23	
2,4-Dinitrophenol	ND	110	
4-Nitrophenol	ND	110	
Dibenzofuran	ND	110	
2,4-Dinitrotoluene	ND	110	
Diethylphthalate	ND	110	
4-Chlorophenylphenylether	ND	110	
Fluorene	ND	23	
4-Nitroaniline	ND	110	
4,6-Dinitro-2-methylphenol	ND	110	
N-Nitrosodiphenylamine	ND	110	
4-Bromophenylphenylether	ND	110	
Hexachlorobenzene	ND	110	
Pentachlorophenol	ND	110	
Phenanthrene	ND	23	
Anthracene	ND	23	
Di-n-butylphthalate	34	110	J
Fluoranthene	30	23	
Pyrene	30	23	
Butylbenzylphthalate	27	110	J
3,3'-dichlorobenzidine	ND	110	
Benzo(a)anthracene	ND	23	
Chrysene	25	23	
bis(2-Ethylhexyl)phthalate	57	110	J
Di-n-octylphthalate	ND	110	
Benzo(b)fluoranthene	ND	23	
Benzo(k)fluoranthene	ND	23	
Benzo(a)pyrene	ND	23	
Indeno(1,2,3-cd)pyrene	ND	23	
Dibenz(a,h)anthracene	ND	23	
Benzo(g,h,i)perylene	ND	23	

5/18/98
SW

SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-1A
Lab ID:	71868-19
Date Received:	4/8/98
Date Prepared:	4/10/98
Date Analyzed:	4/10/98
% Solids	88.45

Semivolatile Organics by USEPA Method 8270

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Nitrobenzene - d5	84		23	120
2 - Fluorobiphenyl	85		30	115
p - Terphenyl - d14	71		18	137
Phenol - d5	90		24	113
2 - Fluorophenol	98		25	121
2,4,6 - Tribromophenol	88		19	122

Sample results are on a dry weight basis.

Analyte	Result (ug/kg)	PQL	Flags
Phenol	ND	110	
bis(2-Chloroethyl)ether	ND	110	
2-Chlorophenol	ND	110	
1,3-Dichlorobenzene	ND	110	
1,4-Dichlorobenzene	ND	110	
Benzyl Alcohol	ND	110	
1,2-Dichlorobenzene	ND	110	
2-Methylphenol	ND	110	
bis(2-Chloroisopropyl)ether	ND	110	
3- & 4-Methylphenol	ND	110	
N-nitroso-di-n-propylamine	ND	110	
Hexachloroethane	ND	110	
Nitrobenzene	ND	110	
Isophorone	ND	110	
2-Nitrophenol	ND	110	
2,4-Dimethylphenol	ND	110	
Benzoic Acid	ND	110	
bis(2-Chloroethoxy)methane	ND	110	
2,4-Dichlorophenol	ND	110	
1,2,4-Trichlorobenzene	ND	110	
Naphthalene	ND	22	
4-Chloroaniline	ND	110	
Hexachlorobutadiene	ND	110	
4-Chloro-3-methylphenol	ND	110	
2-Methylnaphthalene	ND	22	
Hexachlorocyclopentadiene	ND	110	

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SOUND ANALYTICAL SERVICES, INC.

Semivolatile Organics by USEPA Method 8270 data for 71868-19 continued...

Analyte	Result (ug/kg)	PQL	Flags
2,4,6-Trichlorophenol	ND	110	
2,4,5-Trichlorophenol	ND	110	
2-Chloronaphthalene	ND	22	
2-Nitroaniline	ND	110	
Dimethylphthalate	ND	110	
Acenaphthylene	ND	22	
2,6-Dinitrotoluene	ND	110	
3-Nitroaniline	ND	110	
Acenaphthene	ND	22	
2,4-Dinitrophenol	ND	110	
4-Nitrophenol	ND	110	
Dibenzofuran	ND	110	
2,4-Dinitrotoluene	ND	110	
Diethylphthalate	ND	110	
4-Chlorophenylphenylether	ND	110	
Fluorene	ND	22	
4-Nitroaniline	ND	110	
4,6-Dinitro-2-methylphenol	ND	110	
N-Nitrosodiphenylamine	ND	110	
4-Bromophenylphenylether	ND	110	
Hexachlorobenzene	ND	110	
Pentachlorophenol	ND	110	
Phenanthrene	ND	22	
Anthracene	ND	22	
Di-n-butylphthalate	ND	110	
Fluoranthene	ND	22	
Pyrene	ND	22	
Butylbenzylphthalate	ND	110	
3,3'-dichlorobenzidine	ND	110	
Benzo(a)anthracene	ND	22	
Chrysene	ND	22	
bis(2-Ethylhexyl)phthalate	26	110	J
Di-n-octylphthalate	ND	110	
Benzo(b)fluoranthene	ND	22	
Benzo(k)fluoranthene	ND	22	
Benzo(a)pyrene	ND	22	
Indeno(1,2,3-cd)pyrene	ND	22	
Dibenz(a,h)anthracene	ND	22	
Benzo(g,h,i)perylene	ND	22	

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JW

SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-1B
Lab ID:	71868-20
Date Received:	4/8/98
Date Prepared:	4/10/98
Date Analyzed:	4/10/98
% Solids	86.27

Semivolatile Organics by USEPA Method 8270

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Nitrobenzene - d5	86		23	120
2 - Fluorobiphenyl	95		30	115
p - Terphenyl - d14	67		18	137
Phenol - d5	99		24	113
2 - Fluorophenol	96		25	121
2,4,6 - Tribromophenol	88		19	122

Sample results are on a dry weight basis.

Analyte	Result (ug/kg)	PQL	Flags
Phenol	ND	110	
bis(2-Chloroethyl)ether	ND	110	
2-Chlorophenol	ND	110	
1,3-Dichlorobenzene	ND	110	
1,4-Dichlorobenzene	ND	110	
Benzyl Alcohol	ND	110	
1,2-Dichlorobenzene	ND	110	
2-Methylphenol	ND	110	
bis(2-Chloroisopropyl)ether	ND	110	
3- & 4-Methylphenol	ND	110	
N-nitroso-di-n-propylamine	ND	110	
Hexachloroethane	ND	110	
Nitrobenzene	ND	110	
Isophorone	ND	110	
2-Nitrophenol	ND	110	
2,4-Dimethylphenol	ND	110	
Benzoic Acid	ND	110	
bis(2-Chloroethoxy)methane	ND	110	
2,4-Dichlorophenol	ND	110	
1,2,4-Trichlorobenzene	ND	110	
Naphthalene	ND	22	
4-Chloroaniline	ND	110	
Hexachlorobutadiene	ND	110	
4-Chloro-3-methylphenol	ND	110	
2-Methylnaphthalene	ND	22	
Hexachlorocyclopentadiene	ND	110	

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SW

SOUND ANALYTICAL SERVICES, INC.

Semivolatile Organics by USEPA Method 8270 data for 71868-20 continued...

Analyte	Result (ug/kg)	PQL	Flags
2,4,6-Trichlorophenol	ND	110	
2,4,5-Trichlorophenol	ND	110	
2-Chloronaphthalene	ND	22	
2-Nitroaniline	ND	110	
Dimethylphthalate	ND	110	
Acenaphthylene	ND	22	
2,6-Dinitrotoluene	ND	110	
3-Nitroaniline	ND	110	
Acenaphthene	ND	22	
2,4-Dinitrophenol	ND	110	
4-Nitrophenol	ND	110	
Dibenzofuran	ND	110	
2,4-Dinitrotoluene	ND	110	
Diethylphthalate	ND	110	
4-Chlorophenylphenylether	ND	110	
Fluorene	ND	22	
4-Nitroaniline	ND	110	
4,6-Dinitro-2-methylphenol	ND	110	
N-Nitrosodiphenylamine	ND	110	
4-Bromophenylphenylether	ND	110	
Hexachlorobenzene	ND	110	
Pentachlorophenol	ND	110	
Phenanthrene	ND	22	
Anthracene	ND	22	
Di-n-butylphthalate	ND	110	
Fluoranthene	ND	22	
Pyrene	ND	22	
Butylbenzylphthalate	ND	110	
3,3'-dichlorobenzidine	ND	110	
Benzo(a)anthracene	ND	22	
Chrysene	ND	22	
bis(2-Ethylhexyl)phthalate	ND	110	
Di-n-octylphthalate	ND	110	
Benzo(b)fluoranthene	ND	22	
Benzo(k)fluoranthene	ND	22	
Benzo(a)pyrene	ND	22	
Indeno(1,2,3-cd)pyrene	ND	22	
Dibenz(a,h)anthracene	ND	22	
Benzo(g,h,i)perylene	ND	22	

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SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-2A
Lab ID:	71868-21
Date Received:	4/8/98
Date Prepared:	4/10/98
Date Analyzed:	4/10/98
% Solids	87.95

Semivolatile Organics by USEPA Method 8270

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Nitrobenzene - d5	81		23	120
2 - Fluorobiphenyl	80		30	115
p - Terphenyl - d14	74		18	137
Phenol - d5	73		24	113
2 - Fluorophenol	82		25	121
2,4,6 - Tribromophenol	93		19	122

Sample results are on a dry weight basis.

Analyte	Result (ug/kg)	PQL	Flags
Phenol	ND	560	
bis(2-Chloroethyl)ether	ND	560	
2-Chlorophenol	ND	560	
1,3-Dichlorobenzene	ND	560	
1,4-Dichlorobenzene	ND	560	
Benzyl Alcohol	ND	560	
1,2-Dichlorobenzene	ND	560	
2-Methylphenol	ND	560	
bis(2-Chloroisopropyl)ether	ND	560	
3- & 4-Methylphenol	ND	560	
N-nitroso-di-n-propylamine	ND	560	
Hexachloroethane	ND	560	
Nitrobenzene	ND	560	
Isophorone	ND	560	
2-Nitrophenol	ND	560	
2,4-Dimethylphenol	ND	560	
Benzoic Acid	ND	560	
bis(2-Chloroethoxy)methane	ND	560	
2,4-Dichlorophenol	ND	560	
1,2,4-Trichlorobenzene	ND	560	
Naphthalene	ND	110	
4-Chloroaniline	ND	560	
Hexachlorobutadiene	ND	560	
4-Chloro-3-methylphenol	ND	560	
2-Methylnaphthalene	ND	110	
Hexachlorocyclopentadiene	ND	560	

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SOUND ANALYTICAL SERVICES, INC.

Semivolatile Organics by USEPA Method 8270 data for 71868-21 continued...

Analyte	Result (ug/kg)	PQL	Flags
2,4,6-Trichlorophenol	ND	560	
2,4,5-Trichlorophenol	ND	560	
2-Chloronaphthalene	ND	110	
2-Nitroaniline	ND	560	
Dimethylphthalate	ND	560	
Acenaphthylene	ND	110	
2,6-Dinitrotoluene	ND	560	
3-Nitroaniline	ND	560	
Acenaphthene	ND	110	
2,4-Dinitrophenol	ND	560	
4-Nitrophenol	ND	560	
Dibenzofuran	ND	560	
2,4-Dinitrotoluene	ND	560	
Diethylphthalate	ND	560	
4-Chlorophenylphenylether	ND	560	
Fluorene	ND	110	
4-Nitroaniline	ND	560	
4,6-Dinitro-2-methylphenol	ND	560	
N-Nitrosodiphenylamine	ND	560	
4-Bromophenylphenylether	ND	560	
Hexachlorobenzene	ND	560	
Pentachlorophenol	ND	560	
Phenanthrene	ND	110	
Anthracene	ND	110	
Di-n-butylphthalate	ND	560	
Fluoranthene	290	110	
Pyrene	280	110	
Butylbenzylphthalate	ND	560	
3,3'-dichlorobenzidine	ND	560	
Benzo(a)anthracene	160	110	
Chrysene	190	110	
bis(2-Ethylhexyl)phthalate	170	560	J
Di-n-octylphthalate	ND	560	
Benzo(b)fluoranthene	ND	110	
Benzo(k)fluoranthene	ND	110	
Benzo(a)pyrene	ND	110	
Indeno(1,2,3-cd)pyrene	ND	110	
Dibenz(a,h)anthracene	ND	110	
Benzo(g,h,i)perylene	ND	110	

5/15/98
JW

SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-2B
Lab ID:	71868-22
Date Received:	4/8/98
Date Prepared:	4/10/98
Date Analyzed:	4/10/98
% Solids	77.81

Semivolatile Organics by USEPA Method 8270

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Nitrobenzene - d5	76		23	120
2 - Fluorobiphenyl	71		30	115
p - Terphenyl - d14	61		18	137
Phenol - d5	101		24	113
2 - Fluorophenol	100		25	121
2,4,6 - Tribromophenol	93		19	122

Sample results are on a dry weight basis.

Analyte	Result (ug/kg)	PQL	Flags
Phenol	ND	130	
bis(2-Chloroethyl)ether	ND	130	
2-Chlorophenol	ND	130	
1,3-Dichlorobenzene	ND	130	
1,4-Dichlorobenzene	ND	130	
Benzyl Alcohol	ND	130	
1,2-Dichlorobenzene	ND	130	
2-Methylphenol	ND	130	
bis(2-Chloroisopropyl)ether	ND	130	
3- & 4-Methylphenol	ND	130	
N-nitroso-di-n-propylamine	ND	130	
Hexachloroethane	ND	130	
Nitrobenzene	ND	130	
Isophorone	ND	130	
2-Nitrophenol	ND	130	
2,4-Dimethylphenol	ND	130	
Benzoic Acid	ND	130	
bis(2-Chloroethoxy)methane	ND	130	
2,4-Dichlorophenol	ND	130	
1,2,4-Trichlorobenzene	ND	130	
Naphthalene	30	25	
4-Chloroaniline	ND	130	
Hexachlorobutadiene	ND	130	
4-Chloro-3-methylphenol	ND	130	
2-Methylnaphthalene	45	25	
Hexachlorocyclopentadiene	ND	130	

5/18/98
(Signature)

SOUND ANALYTICAL SERVICES, INC.

Semivolatile Organics by USEPA Method 8270 data for 71868-22 continued...

Analyte	Result (ug/kg)	PQL	Flags
2,4,6-Trichlorophenol	ND	130	
2,4,5-Trichlorophenol	ND	130	
2-Chloronaphthalene	ND	25	
2-Nitroaniline	ND	130	
Dimethylphthalate	ND	130	
Acenaphthylene	ND	25	
2,6-Dinitrotoluene	ND	130	
3-Nitroaniline	ND	130	
Acenaphthene	ND	25	
2,4-Dinitrophenol	ND	130	
4-Nitrophenol	ND	130	
Dibenzofuran	ND	130	
2,4-Dinitrotoluene	ND	130	
Diethylphthalate	ND	130	
4-Chlorophenylphenylether	ND	130	
Fluorene	ND	25	
4-Nitroaniline	ND	130	
4,6-Dinitro-2-methylphenol	ND	130	
N-Nitrosodiphenylamine	ND	130	
4-Bromophenylphenylether	ND	130	
Hexachlorobenzene	ND	130	
Pentachlorophenol	ND	130	
Phenanthrene	33	25	
Anthracene	ND	25	
Di-n-butylphthalate	40	130	J
Fluoranthene	ND	25	
Pyrene	ND	25	
Butylbenzylphthalate	620	130	
3,3'-dichlorobenzidine	ND	130	
Benzo(a)anthracene	ND	25	
Chrysene	ND	25	
bis(2-Ethylhexyl)phthalate	76	130	J
Di-n-octylphthalate	ND	130	
Benzo(b)fluoranthene	ND	25	
Benzo(k)fluoranthene	ND	25	
Benzo(a)pyrene	ND	25	
Indeno(1,2,3-cd)pyrene	ND	25	
Dibenz(a,h)anthracene	ND	25	
Benzo(g,h,i)perylene	ND	25	

5/18/98
(2)

71868

CHAIN OF CUSTODY RECORD

REGION 9
75 Hawthorne Street
San Francisco, California 94105

PROJ. NO.		PROJECT NAME		NO. OF CONTAINERS		VOCs EPA 8260 PEST/PCBS EPA 8080 17 CALIFORNIA METALS SVOCs EPA 8270 TOTAL CHLORIDE EPA 8010B TPH (9+D) EPA 8015M						REMARKS	
SAMPLERS: (Signature)													
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION								
✓ ST-4	4/6	1559		X	ST-4A	2X40m	X	X	X	X	X		
✓ ST-4		1608		X	ST-4B	2X40m	X	X	X	X	X		
✓ ST-5		1630		X	ST-5	2X40m	X	X	X	X	X		
✓ DW-1		1617		X	DW-1	2X40m	X	X	X	X	X		DO MS/MSD IF SUFFICIENT SAMPLE VOLUME
✓ BKG-1		1650		X	BKG-1	2X40m	X	X	X	X	X		
✓ ST-3		1545		X	ST-3D	2X1L			X		X		
✓ ST-3		1545		X	ST-3D	1X1L		X					
✓ ST-3		1545		X	ST-3D	4X40m	X				X		
✓ ST-3		1550		X	ST-3E	2X1L			X		X		
✓ ST-3		1550		X	ST-3E	1X1L		X					
✓ ST-3		1550		X	ST-3E	4X40m	X				X		
✓ UST-1		1635		X	UST-1	1X1L			X				* As requested in contract w/ Sound Laboratory
✓ UST-1		1635		X	UST-1	1X1L		X					
✓ UST-1		1635		X	UST-1	6X40m	X				X		
✓ TB		1800		X	TB-2 - 4/6/98	1X40m	X						
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Relinquished by: (Signature)		Date / Time		Received by: (Signature)			
M. Fehru		4/7/98 1200		FED-X									
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Relinquished by: (Signature)		Date / Time		Received by: (Signature)			
Relinquished by: (Signature)		Date / Time		Received for Laboratory by: (Signature)		Date / Time		Remarks					
				S. Giana		4/8/98 930AM		FED-X B/L # 804733300967					

CHAIN OF CUSTODY RECORD

PROJ. NO. KJ9103		PROJECT NAME WDI TANK ASSESSMENT				NO. OF CON- TAINERS	ANALYSIS						REMARKS
SAMPLERS: (Signature) <i>M. Schum</i> <i>Jed Sapp</i>							VOCs EPA 8260	pesticides EPA 8080	13 CALIFORNIA METALS	SVOCs EPA 8270	TOTAL CHLORIDE EPA 9010B	TPH (g/L) EPA 8015M	
STA. NO.	DATE 1998	TIME	COMP.	GRAB	STATION LOCATION								
ST-1	4/6	1420		X	ST-1A	2x4oz	X	X	X	X	X		
ST-1		1425		X	ST-1B		X	X	X	X	X		
ST-2		1445		X	ST-2A		X	X	X	X	X		
ST-2		1451		X	ST-2B		X	X	X	X	X		
ST-3		1520		X	ST-3A	1x1L.				X		NaOH pH > 12	
ST-3		1520		X	ST-3A	1x1L.			X				
ST-3		1520		X	ST-3A	1x1L.		X					
ST-3		1520		X	ST-3A	6x40ml	X						
ST-3		1525		X	ST-3B	2x1L.			X	X		NaOH pH > 12 ON 9010 ANALYSIS	
ST-3		1525		X	ST-3B	1x1L.		X					
ST-3		1525		X	ST-3B	4x40ml	X				X	* AS REQUESTED IN CONTRACT w/	
ST-3		1530		X	ST-3C	2x1LIT.		X		X		Sound LABORATORY	
ST-3		1530		X	ST-3C	1x1L.		X					
ST-3		1530		X	ST-3C	4x40ml	X				X		
TB		1800		X	TB-1-4/6/98	1x40ml	X						

Relinquished by: (Signature) <i>M. Schum</i>	Date / Time 4/7/98 1200	Received by: (Signature) FED-X	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) <i>S. Siano</i>	Date / Time 4/8/98 930AM	Remarks FED-X B/L # 804733300967	

SOUND ANALYTICAL SERVICES, INC.

Client: Ecology & Environment, Inc.

Date: April 29, 1998

Project: KJ9103 WDI Tank Assessment

Lab No.: 71868

SAMPLE EXTRACTION AND ANALYSIS

VOLATILE ORGANICS

Samples 71868-1 through 71868-5, 71868-19 through 71868-22 (soils) and 71868-8, 71868-11, 71868-14, 71868-15, 71868-18, 71868-26, 71868-29, 71868-32 and 71868-33 (liquids) were analyzed for volatile organics in accordance with EPA Method 8260. The soil samples were prepared and analyzed on 4-10-98. The liquid samples were prepared and analyzed on 4-10-98.

Sample 71868-14 was received at a pH of 7. Sample 71868-18 was received at a pH of 5.

All quality control was within the acceptance limits.

Acetone calculation from sample 71868-1

$$\frac{18.98 \times 5\text{ml}}{5.4507\text{g} \times 0.8354}$$

SEMIVOLATILE ORGANICS

Samples 71868-1 through 71868-5 and 71868-20 through 71868-22 (soils) were analyzed for semivolatile organics in accordance with EPA Method 8270. The samples were prepared and analyzed on 4-10-98.

All quality control was within the acceptance limits.

$$\frac{\text{Instrument reading} \times \text{final volume} \times \text{dilution factor}}{\text{sample weight or volume} \times \text{dry weight}}$$

PESTICIDES AND PCBs

Samples 71868-1 through 71868-5, 71868-19 through 71868-22 (soils) and 71868-7, 71868-10, 71868-13, 71868-17, 71868-25, 71868-28, and 71868-31 (liquids) were analyzed for pesticides and PCBs in accordance with EPA Method 8081. The soil samples were extracted on 4-15-98 analyzed on 4-18-98. The liquid samples were extracted on 4-13-98 and analyzed on 4-16-98.

Second column confirmation was performed. The values are flagged "C1" or "C2" as deemed appropriate.

The percent recovery of DCB (surrogate) in the method blank associated with the liquid samples failed low. Reanalysis exhibited similar results. Insufficient sample volume was available for reextraction and reanalysis.

All quality control was within the acceptance limits.

$$\frac{\text{Extract concentration} \times \text{extract volume} \times \text{dilution factor}}{\text{Sample volume or weight} \times \text{percent solids}}$$

ANALYTICAL DATA REVIEW SUMMARY

Site Name: WDI Tank Assessment
Location: Santa Fe Springs, California
PAN No.: 0294-WDSF-XX
TDD No.: 09-9803-0006
Laboratory: Sound Analytical Services, Inc.
Sampling Date: April 6, 1998
Analytical Method: 8015M (TPH-g)
Sample Matrix: Soil/ Water

Sample No.	Sample I.D.	Laboratory I.D.
1	ST-5	71868-03
2	ST-4A	71868-01
3	DW-1	71868-04
4	BKG-1	71868-05
5	ST-3D	71868-08
6	ST-3E	71868-11
7	UST-1	71868-14
8	EB-1	71868-18
9	ST-1A	71868-19
10	ST-2A	71868-21
11	ST-3A	71868-26
12	ST-3B	71868-29
13	ST-3C	71868-32

Data Reviewer: Trisha J. Woolslayer *Trisha J. Woolslayer* 5/18/98
Chemist QA Reviewer: _____
START PM Acceptance: _____

GC METHODS DATA VALIDATION WORKSHEET – SUMMARY

Report No.: 71868
Laboratory: Sound Analytical Services, Inc.
Reviewer: Trisha J. Woolslayer
Review Date: May 15, 1998
Analytical Method: 8015M

No. of Samples **Water:** 7 **Solid:** 6 **Other:**

1.	Holding Times	<u>Y</u>
2.	Surrogate Recovery	<u>Y</u>
3.	Matrix Spike/Spike Duplicate	<u>Y</u>
4.	Blanks	<u>Y</u>
5.	Initial Calibration	<u>Y</u>
6.	Continuing Calibration	<u>Y</u>
7.	Internal Standards	<u>Y</u>
8.	Compound Identification	<u>Y</u>
9.	Compound Quantitation	<u>Y</u>
10.	TIC Identification	<u>Y</u>
11.	System Performance	<u>Y</u>
12.	Overall Assessment	<u>Y</u>

Other Problems/Comments: The sample matrix and preservatives used were not reported on the chain-of-custody.

GC ORGANIC ANALYSES

DATA PACKAGE COMPLETENESS CHECKLIST

Checklist Code: X Included: no problems
 * Included: problems noted in review
 O Not Included and/or Not Available
 NR Not Required
 RS Provided As Re-submission

 X Case Narrative

Quality Control Summary Package

 X Data Summary Sheets (Form I)
 X Surrogate Recovery Summary (Form II)
 X Matrix Spike/Spike Duplicate Recoveries (Form III)
 X Method Blank Summaries (Form IV)
 N/A Pesticide Evaluation Standards Summary (Form VIII)
 N/A Pesticide/ PCB Standards Summary (Form VIII)
 N/A Pesticide/ PCB Identification (Form X)

Sample and Blank Data Package Section

 X Instrument Chromatograms *
 X Integration Results *
 X Confirmation Analysis Results
 X Copies of all Calculations of Results
 O List of Instrument Detection Limits
 X Chain-of-Custody
 X Sample Preparation and Analysis Run Logs
 Other:

* Results for all samples, standards, blanks, MS/MSD and PE samples may be provided.

I. HOLDING TIMES

Acceptable X Outside QC Limits

Samples were prepared and analyzed within applicable holding times, except as noted below. Generally, water samples have a holding time of 7 days (HCL preserved water samples may be held for 14 days prior to extraction). Soil, sludge and sediment samples have a holding time of 14 days. Water and soil extracts may be held for 40 days, in sealed amber vials at 4C prior to analysis. For those sample fractions prepared or analyzed outside of holding time requirements, results greater than the Method detection Limit (MDL) have been qualified as estimates ("J"). Results less than the MDL may be flagged as estimated ("UJ") or rejected ("R") based on the professional judgement of the data reviewer.

Comments:

All water samples except for ST-3D had results below the detection limits. All water samples were held more than the allowable seven day holding time. Mr. Mike Schwenessen of Ecology & Environment reported that all samples were preserved. Based on the preservation of the water samples, no data were qualified with regards to holding times.

II. INSTRUMENT PERFORMANCE

A. Initial and Continuing Calibration

Acceptable X Outside QC Limits

Verify that a minimum of five Initial Calibration Standards (ICS) were used to construct the Response Factor(s) (Rf) or standard curve. Verify that the lowest concentrated ICS is at or near the reported Method Detection Limit (MDL). confirm that the Mean Rf possesses a Percent Relative Standard Deviation (%RSD) <20%. Verify that all Continuing Calibration Verification (CCV) results possess a Percent Difference (%D) <15% (quantitation column) and $\leq 20\%$ (confirmation column, if applicable). All positive results associated with invalid initial and/or continuing calibration data are reported as estimates ("J").

Comments:

No comments.

II. (CONT.)

B. Peak Resolution and Retention Time Stability

Acceptable X Outside QC Limits

The raw data was checked to verify that there was adequate resolution ($R < 25\%$) between peaks of the standard compounds. Confirm that the laboratory has submitted valid Retention Time (RT) windows for all compounds of interest, including surrogates (Surr) and Internal Standards (IS), if applicable. Check the RT data and verify that all raw data (QC and samples) conforms to established RT windows. If a single sample RT shift was noted, was a post extraction spike of the same sample analyzed? If a consistent RT shift was observed in several samples, was the same RT shift observed in the MS/MSD? To confirm that the RT shift was matrix related, was a CCV standard successfully analyzed at the end of the analytical sequence?

Comments:

No comments.

III. METHOD PERFORMANCE

A. Laboratory Control Sample

Acceptable X Outside QC Limits

Verify that a Laboratory Control Sample (LCS), containing all of the compounds of interest was successfully analyzed at the beginning of the analytical sequence to confirm acceptable method performance. If more than 20% of LCS compounds failed to meet a %Recovery (%R) of 85-115% of the true value, was a second LCS analyzed to re-check the failed compounds? If a LCS was not successfully analyzed (or re-analyzed), all positive sample data for the failed compounds are qualified as estimates ("J").

Comments:

No comments.

III. (CONT.)

B. Surrogate(s) and Internal Standard(s)

If the method of Internal Standard (IS) analysis was utilized, verify that the IS recovery for each sample analyzed did not vary by more than a factor of 2 (i.e. <50% of >100%) compared to the average IS response from the initial calibration. Verify that all Surrogate (Surr) recoveries are within the acceptable laboratory control limits. If any IS or surrogate quality control criteria is not within control limits, sample data qualification is left to the professional judgement of the data reviewer.

Comments:

No comments.

III. (CONT.)

C. Error Determination

<u> X </u>	Matrix Spike/Spike Duplicate Samples Analyzed
<u> </u>	No Spike Samples Analyzed

A Matrix Spike/Matrix Spike Duplicate (MS/MSD) pair may be analyzed to **estimate** bias or % Recovery (%Rec), and precision or Relative Percent Difference (RPD). The %Rec for the MS and MSD should not exceed the limits of 80-120% of the spiked concentration. The MS/MSD RPD should not exceed 20%. Sample results associated with poor MS/MSD data may be reported as estimates ("J") based on the reviewers professional judgement and the nature of the samples and analyte(s). **NOTE: A low %Rec for the MS and MSD, and acceptable MS/MSD RPD may indicate an unavoidable matrix related error associated with the entire sample group. A duplicate LCS analyzed at the end of the analytical sequence may be used to confirm the existence of a matrix related error.**

Comments:

No comments.

IV. BLANKS AND BACKGROUND SAMPLES

Acceptable X Detection Limits Adjusted

The following blanks were analyzed:

<u> X </u>	Preparation Blanks	<u> </u>	Field Blanks
<u> </u>	Instrument Blanks	<u> X </u>	Rinsate Blanks
<u> X </u>	Background Samples	<u> </u>	Trip Blanks

Verify that at least one instrument blank and preparation blank was successfully analyzed prior to the analysis of any samples. A preparation blank was prepared and analyzed per sample batch or at a frequency of 5% (i.e. every 20 samples), which ever was most frequent. Verify that the instrument blank possessed less than the Instrument Detection Limit (IDL) and the preparation blank possessed less than the MDL of any compound or interfering peak. All sample results less than 5x the preparation blank results were qualified as non-detect at an estimated detection limit ("UJ"). The remaining blanks and background sample results are evaluated and used to qualify data at the discretion of the data reviewer.

Comments:

No comments.

V. COMPOUND IDENTIFICATION

Where applicable, verify that qualitative criteria for dual column confirmation analysis was met for all positive compound identifications. A dissimilar GC column and identical detector were used for the confirmation analysis (GC/MS analysis may also be used for confirmatory analysis, where applicable). If qualitative criteria were not met, all reported positive results for a sample or sample delivery group were qualified as presumptively present at an estimated quantity ("NJ").

Comments:

No comments.

VI. COMPOUND QUANTITATION AND REPORTED DETECTION LIMITS

Verify that compound quantitation and detection limit reporting for both positive and non-detect samples were correctly adjusted to account for dilutions, extract concentration, splits, clean-up procedures, sample dry weight factors etc. All errors were reported to the laboratory for re-submission of the data.

Comments:

No comments.

VII. PERFORMANCE EVALUATION SAMPLES

Acceptable	_____	Not Analyzed	_____X_____
Failed	_____		_____

If a performance sample was submitted, were the laboratory reported recoveries within the documented limits? If 50%, or more of the performance sample compounds were outside of the established confidence limits or were misidentified, all sample results were rejected ("R"). If less than 50% of the performance sample compounds was outside of the established confidence limits or misidentified, qualification is left to the professional judgement of the data reviewer.

Comments:

No performance evaluation sample submitted.

XII. OVERALL ASSESSMENT OF GENERAL ANALYTICAL DATA

On the basis of this review, the following determination has been made with regard to the overall data usability for the specified level.

Acceptable	<u>X</u>	Accepted with Qualification	<u> </u>
Rejected	<u> </u>		<u> </u>

Accepted data meet the minimum requirements for the following EPA data category:

ERS Screening	<u> </u>
Non-definitive with 10% Conformation by Definitive Methodology	<u> </u>
Definitive	<u>X</u>
Without Comprehensive Statistical Error Determination	<u>X</u>
With Comprehensive Statistical error Determination	<u> </u>

Any qualifications to individual sample analysis results are detailed in the appropriate section above or appear under the comments section below. In cases where several QC criteria are out of specification, it may be appropriate to further qualify the data usability. The data reviewer must use professional judgment and express concerns and comments on the data validity for each specific data package.

Comments:

- The sample matrix and preservatives used were not reported on the chain-of-custody.*
- All water samples were held more than the allowable seven day holding time. Based on the reported preservation of the water samples, no data were qualified with regards to holding times.*

ANALYTICAL DATA REVIEW

APPENDIX A

DATA VALIDATION QUALIFIERS

The following list of data validation qualifiers may be used in this data review package:

- | | |
|------------|--|
| J | The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or because quality control criteria were not met. |
| N | Presumptive evidence of presence of material. |
| NJ | Presumptive evidence of the presence of the material at an estimated quantity. |
| U | The material was analyzed for, but not detected. The associated numerical value is the sample detection limit or adjusted sample detection limit. |
| UJ | The material was analyzed for, but not detected. The reported detection limit is estimated because quality control criteria were not met. |
| R | The sample results are rejected (analyte may or may not be present) due to gross deficiencies in quality control criteria. Any reported value is unusable. |
| RND | Recovery Not Determined (Optional). |
| PND | Precision Not Determined (Optional). |

ANNOTATED DATA SUMMARY SHEETS

Hand-annotated copies of the Data Summary Sheets from the analytical data package follow. When appropriate, detection limits have been adjusted to reflect effects of relevant qualifications noted during the data review. Errors in the reporting of detected compound results will usually not be changed by hand. In these cases, the laboratory may be required to re-submit portions of the data package and any affected Data summary Sheets. Any additional quality control failures have been flagged using the above listed data validation qualifiers.

Pages of Annotated Data summary Sheets follow.

SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-4A
Lab ID:	71868-01
Date Received:	4/8/98
Date Prepared:	4/16/98
Date Analyzed:	4/17/98
% Solids	83.54

Total Petroleum Hydrocarbons as Gasoline by USEPA Method 8015 Modified

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Trifluorotoluene	77		50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Gasoline Range Organics	48	1.2	

5/18/98
DW

SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-5
Lab ID:	71868-03
Date Received:	4/8/98
Date Prepared:	4/16/98
Date Analyzed:	4/17/98
% Solids	76.18

Total Petroleum Hydrocarbons as Gasoline by USEPA Method 8015 Modified

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Trifluorotoluene	-	X8	50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Gasoline Range Organics	210	26	

5/18/98
SW

SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	DW-1
Lab ID:	71868-04
Date Received:	4/8/98
Date Prepared:	4/16/98
Date Analyzed:	4/17/98
% Solids	78.68

Total Petroleum Hydrocarbons as Gasoline by USEPA Method 8015 Modified

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Trifluorotoluene	77		50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Gasoline Range Organics	ND	1.2	

5/18/98
(DW)

SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	BKG-1
Lab ID:	71868-05
Date Received:	4/8/98
Date Prepared:	4/16/98
Date Analyzed:	4/17/98
% Solids	86.3

Total Petroleum Hydrocarbons as Gasoline by USEPA Method 8015 Modified

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Trifluorotoluene	80		50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Gasoline Range Organics	1.3	1.2	

5/18/98
(signature)

SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-3D
Lab ID:	71868-08
Date Received:	4/8/98
Date Prepared:	4/16/98
Date Analyzed:	4/17/98
% Solids	-

Total Petroleum Hydrocarbons as Gasoline by USEPA Method 8015 Modified

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Trifluorotoluene	96		50	150

Analyte	Result (mg/L)	PQL	Flags
Gasoline Range Organics	0.037	0.025	

5/18/98
④

SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-3E
Lab ID:	71868-11
Date Received:	4/8/98
Date Prepared:	4/16/98
Date Analyzed:	4/17/98
% Solids	-

Total Petroleum Hydrocarbons as Gasoline by USEPA Method 8015 Modified

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Trifluorotoluene	89		50	150

Analyte	Result (mg/L)	PQL	Flags
Gasoline Range Organics	ND	0.025	

5/18/98
SW

SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	UST-1
Lab ID:	71868-14
Date Received:	4/8/98
Date Prepared:	4/16/98
Date Analyzed:	4/17/98
% Solids	-

Total Petroleum Hydrocarbons as Gasoline by USEPA Method 8015 Modified

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Trifluorotoluene	93		50	150

Analyte	Result (mg/L)	PQL	Flags
Gasoline Range Organics	ND	0.025	

5/18/98
ju

SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	EB-1
Lab ID:	71868-18
Date Received:	4/8/98
Date Prepared:	4/16/98
Date Analyzed:	4/17/98
% Solids	-

Total Petroleum Hydrocarbons as Gasoline by USEPA Method 8015 Modified

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Trifluorotoluene	94		50	150

Analyte	Result (mg/L)	PQL	Flags
Gasoline Range Organics	ND	0.025	

5/18/98
(sw)

SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-1A
Lab ID:	71868-19
Date Received:	4/8/98
Date Prepared:	4/16/98
Date Analyzed:	4/17/98
% Solids	88.45

Total Petroleum Hydrocarbons as Gasoline by USEPA Method 8015 Modified

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Trifluorotoluene	72		50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Gasoline Range Organics	ND	1.1	

5/18/98
20

SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-2A
Lab ID:	71868-21
Date Received:	4/8/98
Date Prepared:	4/16/98
Date Analyzed:	4/17/98
% Solids	87.95

Total Petroleum Hydrocarbons as Gasoline by USEPA Method 8015 Modified

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Trifluorotoluene	76		50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Gasoline Range Organics	1.5	1.1	

5/18/98
gu

SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-3A
Lab ID:	71868-26
Date Received:	4/8/98
Date Prepared:	4/16/98
Date Analyzed:	4/17/98
% Solids	-

Total Petroleum Hydrocarbons as Gasoline by USEPA Method 8015 Modified

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Trifluorotoluene	91		50	150

Analyte	Result (mg/L)	PQL	Flags
Gasoline Range Organics	ND	0.025	

5/18/98
(sw)

SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-3B
Lab ID:	71868-29
Date Received:	4/8/98
Date Prepared:	4/16/98
Date Analyzed:	4/17/98
% Solids	-

Total Petroleum Hydrocarbons as Gasoline by USEPA Method 8015 Modified

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Trifluorotoluene	95		50	150

Analyte	Result (mg/L)	PQL	Flags
Gasoline Range Organics	ND	0.025	

5/18/98
SW

SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-3C
Lab ID:	71868-32
Date Received:	4/8/98
Date Prepared:	4/16/98
Date Analyzed:	4/17/98
% Solids	-

Total Petroleum Hydrocarbons as Gasoline by USEPA Method 8015 Modified

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Trifluorotoluene	94		50	150

Analyte	Result (mg/L)	PQL	Flags
Gasoline Range Organics	ND	0.025	

5/18/98
(20)

71868

CHAIN OF CUSTODY RECORD

REGION 9
75 Hawthorne Street
San Francisco, California 94105

PROJ. NO.		PROJECT NAME				NO. OF CON- TAINERS	REMARKS									
SAMPLERS: (Signature)																
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION		VOCs EPA 8260	PEST/PCBs EPA 8080	17 CALIFORNIA METALS	SUACS EPA 8270	TOTAL CHLORIDE EPA 8010B	TPH (9+2) EPA 8015M				
✓ ST-4	4/6	1559		X	ST-4A	2X40m	X	X	X	X	X	X				
✓ ST-4		1608		X	ST-4B	2X40m	X	X	X	X	X	X				
✓ ST-5		1630		X	ST-5	2X40m	X	X	X	X	X	X				
✓ DW-1		1617		X	DW-1	2X40m	X	X	X	X	X	X	DO MS/MSD IF SUFFICIENT SAMPLE VOLUME			
✓ BKG-1		1650		X	BKG-1	2X40m	X	X	X	X	X	X				
✓ ST-3		1545		X	ST-3D	2X1L			X							
✓ ST-3		1545		X	ST-3D	1X1L		X								
✓ ST-3		1545		X	ST-3D	4X40m	X				X					
✓ ST-3		1550		X	ST-3E	2X1L			X		X					
✓ ST-3		1550		X	ST-3E	1X1L		X								
✓ ST-3		1550		X	ST-3E	4X40m	X				X					
✓ UST-1		1635		X	UST-1	1X1L			X				* As requested in contract w/ Sound Laboratory			
✓ UST-1		1635		X	UST-1	1X1L		X								
✓ UST-1		1635		X	UST-1	6X40m	X				X					
✓ TB		1800		X	TB-2 - 4/6/98	1X40m	X									
Relinquished by: (Signature)			Date / Time		Received by: (Signature)			Relinquished by: (Signature)			Date / Time		Received by: (Signature)			
M. Schur			4/7/98 1200		FED-X											
Relinquished by: (Signature)			Date / Time		Received by: (Signature)			Relinquished by: (Signature)			Date / Time		Received by: (Signature)			
Relinquished by: (Signature)			Date / Time		Received for Laboratory by: (Signature)			Date / Time		Remarks						
					S. Liang			4/8/98 930AM		FED-X B/L # 804733300967						

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CHAIN OF CUSTODY RECORD

REGION 9
75 Hawthorne Street
San Francisco, California 94105

PROJ. NO.		PROJECT NAME				NO. OF CON- TAINERS	ANALYSIS						REMARKS
KJ9103		WDI TANK ASSESSMENT					VOCs EPA 8260	PEST/PCBs EPA 8080	13 CALIFORNIA METALS	SVOCs EPA 8270	TOTAL CYANIDE EPA 9010 B	TPH (g/L) * EPA 8015 M	
SAMPLERS: (Signature)													
M. Helmer													
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION								
ST-1	4/6	1420		X	ST-1A	2x40z	X	X	X	X	X		
ST-1		1425		X	ST-1B		X	X	X	X			
ST-2		1445		X	ST-2A		X	X	X	X			
ST-2		1451		X	ST-2B		X	X	X	X			
ST-3		1520		X	ST-3A	1x1L.				X			NaOH pH > 12
ST-3		1520		X	ST-3A	1x1L.		X	X				
ST-3		1520		X	ST-3A	1x1L.		X					
ST-3		1520		X	ST-3A	6x40ml	X						
ST-3		1525		X	ST-3B	2x1L.		X		X			NaOH pH > 12 ON 9010 ANALYSIS
ST-3		1525		X	ST-3B	1x1L.		X	X				
ST-3		1525		X	ST-3B	4x40ml	X						* AS REQUESTED IN CONTRACT W/
ST-3		1530		X	ST-3C	2x1LIT.		X		X			SOUND LABORATORY
ST-3		1530		X	ST-3C	1x1L.		X					
ST-3		1530		X	ST-3C	4x40ml	X						
TB		1800		X	TB-1-4/6/98	1x40ml	X						

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
M. Helmer	4/7/98 1200	FED-X			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
		Signature	4/8/98 930AM	FED-X B/L # 804733300967	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

SOUND ANALYTICAL SERVICES, INC.

Client: Ecology & Environment, Inc.

Date: April 28, 1998

Project: KJ9103 WDI Tank Assessment

Lab No.: 71868

GASOLINE RANGE ORGANICS

Samples 71868-1, 71868-4 through 71868-5, 71868-19 and 71868-21 (soils) and 71868-8, 71868-11, 71868-14, 71868-18, 71868-26, 71868-29 and 71868-32 (liquids) were analyzed for gasoline range organics in accordance with EPA Method 8015 Modified. The soil sample were extracted on 4-16-98 and analyzed on 4-17-98. The liquid samples were prepared on 4-16-98 and analyzed on 4-17-98.

Sample 71868-14 was received with a pH of 6. Sample 71868-18 was received with a pH of 5.

All quality control was within the acceptance limits.

Waters
quant value x dilution factor

Soils
$$\frac{\text{quant. Value} \times \text{dilution factor} \times 10 \times 40}{\text{sample weight} \times \text{percent solids}}$$

DIESEL RANGE ORGANICS

Samples 71868-1, 71868-3 through 71868-5, 71868-19 and 71868-21 (soils) were analyzed for diesel range organics in accordance with EPA Method 8015 Modified. Several liquid samples were noted on the chain of custody for diesel range organic analysis. Insufficient sample volume was submitted for the liquid analysis and therefor canceled. The soil samples were extracted on 4-20-98 and analyzed on 4-21-98.

The contaminant present in samples 71868-1, 71868-4, 71868-5 and 71868-21 did not appear to be typical diesel range product. The elution pattern suggests that it may be heavy oil.

The contaminant present in sample 71868-3 did not appear to be typical diesel range product.

All quality control was within the acceptance limits.

$$\frac{\text{Instrument reading} \times \text{final volume} \times \text{dilution factor}}{\text{sample weight or volume} \times \text{dry weight}}$$

TOTAL METALS

Samples 71868-1 through 71868-5, and 71868-19 through 71868-22 (soils) and 71868-6, 71868-9, 71868-12, 71868-16, 71868-24, 71868-27 and 71868-30 (liquids) were analyzed for CA metals in accordance with EPA Methods 7470/7471/6010. The soil samples were digested on 4-9-98 and 4-13-98 and analyzed on 4-10-98 and 4-13-98. The liquid samples were digested and analyzed on 4-10-98.

The percent recoveries of antimony, lead and zinc in the matrix spike analyses of sample 71868-1 exceeded the control limits. The sample was reanalyzed with similar results. Matrix interference is indicated by the post digest spike percent recoveries.

ANALYTICAL DATA REVIEW SUMMARY

Site Name: WDI Tank Assessment
Location: Santa Fe Springs, California
PAN No.: 0294-WDSF-XX
TDD No.: 09-9803-0006
Laboratory: Sound Analytical Services, Inc.
Sampling Date: April 6, 1998
Analytical Method: 8015M
Sample Matrix: Soil

Sample No.	Sample I.D.	Laboratory I.D.
1	ST-4A	71868-01
2	ST-5	71868-03
3	DW-1	71868-04
4	BKG-1	71868-05
5	ST-1A	71868-19
6	ST-2A	71868-21

Data Reviewer: Trisha J. Woolslayer *Trisha J. Woolslayer 5/18/98*
Chemist QA Reviewer: _____
START PM Acceptance: _____

GC METHODS DATA VALIDATION WORKSHEET – SUMMARY

Report No.: 71868
Laboratory: Sound Analytical Services, Inc.
Reviewer: Trisha J. Woolslayer
Review Date: May 15, 1998
Analytical Method: 8015M

No. of Samples **Water:** _____ **Solid:** 6 **Other:** _____

1.	Holding Times	<u>Y</u>
2.	Surrogate Recovery	<u>Y</u>
3.	Matrix Spike/Spike Duplicate	<u>Y</u>
4.	Blanks	<u>Y</u>
5.	Initial Calibration	<u>Y</u>
6.	Continuing Calibration	<u>Y</u>
7.	Internal Standards	<u>Y</u>
8.	Compound Identification	<u>Y</u>
9.	Compound Quantitation	<u>Y</u>
10.	TIC Identification	<u>Y</u>
11.	System Performance	<u>Y</u>
12.	Overall Assessment	<u>Y</u>

Other Problems/Comments: The sample matrix and types of preservatives used were not reported on the chain-of-custody. CLP summary forms were not provided. Therefore, data was validated based on the raw data package.

GC ORGANIC ANALYSES

DATA PACKAGE COMPLETENESS CHECKLIST

Checklist Code:	<u>X</u>	Included: no problems
	<u>*</u>	Included: problems noted in review
	<u>O</u>	Not Included and/or Not Available
	<u>NR</u>	Not Required
	<u>RS</u>	Provided As Re-submission

X Case Narrative

Quality Control Summary Package

<u>X</u>	Data Summary Sheets (Form I)
<u>X</u>	Surrogate Recovery Summary (Form II)
<u>X</u>	Matrix Spike/Spike Duplicate Recoveries (Form III)
<u>X</u>	Method Blank Summaries (Form IV)
<u>N/A</u>	Pesticide Evaluation Standards Summary (Form VIII)
<u>N/A</u>	Pesticide/ PCB Standards Summary (Form VIII)
<u>N/A</u>	Pesticide/ PCB Identification (Form X)

Sample and Blank Data Package Section

<u>X</u>	Instrument Chromatograms *
<u>X</u>	Integration Results *
<u>X</u>	Confirmation Analysis Results
<u>O</u>	Copies of all Calculations of Results
<u>O</u>	List of Instrument Detection Limits
<u>X</u>	Chain-of-Custody
<u>X</u>	Sample Preparation and Analysis Run Logs
<u> </u>	Other:

* Results for all samples, standards, blanks, MS/MSD and PE samples may be provided.

I. HOLDING TIMES

Acceptable X Outside QC Limits

Samples were prepared and analyzed within applicable holding times, except as noted below. Generally, water samples have a holding time of 7 days (HCL preserved water samples may be held for 14 days prior to extraction). Soil, sludge and sediment samples have a holding time of 14 days. Water and soil extracts may be held for 40 days, in sealed amber vials at 4C prior to analysis. For those sample fractions prepared or analyzed outside of holding time requirements, results greater than the Method detection Limit (MDL) have been qualified as estimates ("J"). Results less than the MDL may be flagged as estimated ("UJ") or rejected ("R") based on the professional judgement of the data reviewer.

Comments:

No comments.

II. INSTRUMENT PERFORMANCE

A. Initial and Continuing Calibration

Acceptable X Outside QC Limits

Verify that a minimum of five Initial Calibration Standards (ICS) were used to construct the Response Factor(s) (Rf) or standard curve. Verify that the lowest concentrated ICS is at or near the reported Method Detection Limit (MDL). confirm that the Mean Rf possesses a Percent Relative Standard Deviation (%RSD) <20%. Verify that all Continuing Calibration Verification (CCV) results possess a Percent Difference (%D) <15% (quantitation column) and $\leq 20\%$ (confirmation column, if applicable). All positive results associated with invalid initial and/or continuing calibration data are reported as estimates ("J").

Comments:

No comments.

II. (CONT.)

B. Peak Resolution and Retention Time Stability

Acceptable X Outside QC Limits

The raw data was checked to verify that there was adequate resolution ($R < 25\%$) between peaks of the standard compounds. Confirm that the laboratory has submitted valid Retention Time (RT) windows for all compounds of interest, including surrogates (Surr) and Internal Standards (IS), if applicable. Check the RT data and verify that all raw data (QC and samples) conforms to established RT windows. If a single sample RT shift was noted, was a post extraction spike of the same sample analyzed? If a consistent RT shift was observed in several samples, was the same RT shift observed in the MS/MSD? To confirm that the RT shift was matrix related, was a CCV standard successfully analyzed at the end of the analytical sequence?

Comments:

No comments.

III. METHOD PERFORMANCE

A. Laboratory Control Sample

Acceptable X Outside QC Limits

Verify that a Laboratory Control Sample (LCS), containing all of the compounds of interest was successfully analyzed at the beginning of the analytical sequence to confirm acceptable method performance. If more than 20% of LCS compounds failed to meet a %Recovery (%R) of 85-115% of the true value, was a second LCS analyzed to re-check the failed compounds? If a LCS was not successfully analyzed (or re-analyzed), all positive sample data for the failed compounds are qualified as estimates ("J").

Comments:

No comments.

III. (CONT.)

B. Surrogate(s) and Internal Standard(s)

If the method of Internal Standard (IS) analysis was utilized, verify that the IS recovery for each sample analyzed did not vary by more than a factor of 2 (i.e. <50% of >100%) compared to the average IS response from the initial calibration. Verify that all Surrogate (Surr) recoveries are within the acceptable laboratory control limits. If any IS or surrogate quality control criteria is not within control limits, sample data qualification is left to the professional judgement of the data reviewer.

Comments:

No comments.

III. (CONT.)

C. Error Determination

 X Matrix Spike/Spike Duplicate Samples Analyzed
 No Spike Samples Analyzed

A Matrix Spike/Matrix Spike Duplicate (MS/MSD) pair may be analyzed to **estimate** bias or % Recovery (%Rec), and precision or Relative Percent Difference (RPD). The %Rec for the MS and MSD should not exceed the limits of 80-120% of the spiked concentration. The MS/MSD RPD should not exceed 20%. Sample results associated with poor MS/MSD data may be reported as estimates ("J") based on the reviewers professional judgement and the nature of the samples and analyte(s). **NOTE: A low %Rec for the MS and MSD, and acceptable MS/MSD RPD may indicate an unavoidable matrix related error associated with the entire sample group. A duplicate LCS analyzed at the end of the analytical sequence may be used to confirm the existence of a matrix related error.**

Comments:

No comments.

IV. BLANKS AND BACKGROUND SAMPLES

Acceptable X Detection Limits Adjusted

The following blanks were analyzed:

<u> X </u>	Preparation Blanks	<u> </u>	Field Blanks
<u> X </u>	Instrument Blanks	<u> </u>	Rinsate Blanks
<u> </u>	Background Samples	<u> </u>	Trip Blanks

Verify that at least one instrument blank and preparation blank was successfully analyzed prior to the analysis of any samples. A preparation blank was prepared and analyzed per sample batch or at a frequency of 5% (i.e. every 20 samples), which ever was most frequent. Verify that the instrument blank possessed less than the Instrument Detection Limit (IDL) and the preparation blank possessed less than the MDL of any compound or interfering peak. All sample results less than 5x the preparation blank results were qualified as non-detect at an estimated detection limit ("UJ"). The remaining blanks and background sample results are evaluated and used to qualify data at the discretion of the data reviewer.

Comments:

No comments.

V. COMPOUND IDENTIFICATION

Where applicable, verify that qualitative criteria for dual column confirmation analysis was met for all positive compound identifications. A dissimilar GC column and identical detector were used for the confirmation analysis (GC/MS analysis may also be used for confirmatory analysis, where applicable). If qualitative criteria were not met, all reported positive results for a sample or sample delivery group were qualified as presumptively present at an estimated quantity ("NJ").

Comments:

No comments.

VI. COMPOUND QUANTITATION AND REPORTED DETECTION LIMITS

Verify that compound quantitation and detection limit reporting for both positive and non-detect samples were correctly adjusted to account for dilutions, extract concentration, splits, clean-up procedures, sample dry weight factors etc. All errors were reported to the laboratory for re-submission of the data.

Comments:

No comments.

VII. PERFORMANCE EVALUATION SAMPLES

Acceptable	_____	Not Analyzed	_____ <i>X</i> _____
Failed	_____		_____

If a performance sample was submitted, were the laboratory reported recoveries within the documented limits? If 50%, or more of the performance sample compounds were outside of the established confidence limits or were misidentified, all sample results were rejected ("R"). If less than 50% of the performance sample compounds was outside of the established confidence limits or misidentified, qualification is left to the professional judgement of the data reviewer.

Comments:

No comments.

XII. OVERALL ASSESSMENT OF GENERAL ANALYTICAL DATA

On the basis of this review, the following determination has been made with regard to the overall data usability for the specified level.

Acceptable	<u>X</u>	Accepted with Qualification	<u> </u>
Rejected	<u> </u>		<u> </u>

Accepted data meet the minimum requirements for the following EPA data category:

ERS Screening	<u> </u>
Non-definitive with 10% Conformation by Definitive Methodology	<u> </u>
Definitive	<u>X</u>
Without Comprehensive Statistical Error Determination	<u>X</u>
With Comprehensive Statistical error Determination	<u> </u>

Any qualifications to individual sample analysis results are detailed in the appropriate section above or appear under the comments section below. In cases where several QC criteria are out of specification, it may be appropriate to further qualify the data usability. The data reviewer must use professional judgment and express concerns and comments on the data validity for each specific data package.

Comments:

- *The sample matrix and types of preservatives used were not reported on the chain-of-custody.*
- *CLP summary forms were not provided. Therefore, data was validated based on the raw data package.*

ANALYTICAL DATA REVIEW

APPENDIX A

DATA VALIDATION QUALIFIERS

The following list of data validation qualifiers may be used in this data review package:

- | | |
|------------|--|
| J | The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or because quality control criteria were not met. |
| N | Presumptive evidence of presence of material. |
| NJ | Presumptive evidence of the presence of the material at an estimated quantity. |
| U | The material was analyzed for, but not detected. The associated numerical value is the sample detection limit or adjusted sample detection limit. |
| UJ | The material was analyzed for, but not detected. The reported detection limit is estimated because quality control criteria were not met. |
| R | The sample results are rejected (analyte may or may not be present) due to gross deficiencies in quality control criteria. Any reported value is unusable |
| RND | Recovery Not Determined (Optional). |
| PND | Precision Not Determined (Optional). |

ANNOTATED DATA SUMMARY SHEETS

Hand-annotated copies of the Data Summary Sheets from the analytical data package follow. When appropriate, detection limits have been adjusted to reflect effects of relevant qualifications noted during the data review. Errors in the reporting of detected compound results will usually not be changed by hand. In these cases, the laboratory may be required to re-submit portions of the data package and any affected Data summary Sheets. Any additional quality control failures have been flagged using the above listed data validation qualifiers.

Pages of Annotated Data summary Sheets follow.

SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-4A
Lab ID:	71868-01
Date Received:	4/8/98
Date Prepared:	4/20/98
Date Analyzed:	4/21/98
% Solids	83.54

Diesel Range Organics by Method 3550/8015 Modified

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
o-Terphenyl	121		50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Diesel Range Organics	650	30	X1

5/18/98 *(signature)*

SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-5
Lab ID:	71868-03
Date Received:	4/8/98
Date Prepared:	4/20/98
Date Analyzed:	4/21/98
% Solids	76.18

Diesel Range Organics by Method 3550/8015 Modified

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
o-Terphenyl	112		50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Diesel Range Organics	97	16	X2

5/18/98
30

SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	DW-1
Lab ID:	71868-04
Date Received:	4/8/98
Date Prepared:	4/20/98
Date Analyzed:	4/21/98
% Solids	78.68

Diesel Range Organics by Method 3550/8015 Modified

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
o-Terphenyl	108		50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Diesel Range Organics	250	16	X1

5/18/98
Ju

SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	BKG-1
Lab ID:	71868-05
Date Received:	4/8/98
Date Prepared:	4/20/98
Date Analyzed:	4/21/98
% Solids	86.3

Diesel Range Organics by Method 3550/8015 Modified

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
o-Terphenyl	95		50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Diesel Range Organics	23	14	X1

5/18/98
(m)

SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-1A
Lab ID:	71868-19
Date Received:	4/8/98
Date Prepared:	4/20/98
Date Analyzed:	4/21/98
% Solids	88.45

Diesel Range Organics by Method 3550/8015 Modified

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
o-Terphenyl	98		50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Diesel Range Organics	ND	14	

5/18/98
(Signature)

SOUND ANALYTICAL SERVICES, INC.

Client Name	Ecology & Environment, Inc.
Client ID:	ST-2A
Lab ID:	71868-21
Date Received:	4/8/98
Date Prepared:	4/20/98
Date Analyzed:	4/21/98
% Solids	87.95

Diesel Range Organics by Method 3550/8015 Modified

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
o-Terphenyl	71		50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Diesel Range Organics	220	28	X1

5/18/98
(JW)

CHAIN OF CUSTODY RECORD

75 Hawthorne Street
San Francisco, California 94105

PROJ. NO.		PROJECT NAME				NO. OF CON- TAINERS	REMARKS					
SAMPLERS: (Signature)							VOCs EPA 820 RES/PCBs EPA 8080 17 CALIFORNIA METALS SVOCs EPA 8220 TOTAL CHLORIDE EPA 9010B TPH (9+1) EPA 8015M					
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION							
✓ ST-4	4/6	1559		X	ST-4A	2X40m	X	X	X	X	X	
✓ ST-4		1608		X	ST-4B	2X40m	X	X	X	X	X	
✓ ST-5		1630		X	ST-5	2X40m	X	X	X	X	X	
✓ DW-1		1617		X	DW-1	2X40m	X	X	X	X	X	DO MS/MSD IF SUFFICIENT SAMPLE VOLUME
✓ BKG-1		1650		X	BKG-1	2X40m	X	X	X	X	X	
✓ ST-3		1545		X	ST-3D	2X1L			X	X		
✓ ST-3		1545		X	ST-3D	1X1L		X				
✓ ST-3		1545		X	ST-3D	4X40m	X				X	
✓ ST-3		1550		X	ST-3E	2X1L			X	X		
✓ ST-3		1550		X	ST-3E	1X1L		X				
✓ ST-3		1550		X	ST-3E	4X40m	X				X	
✓ UST-1		1635		X	UST-1	1X1L			X			* As requested in contract w/ Sound Laboratory
✓ UST-1		1635		X	UST-1	1X1L		X				
✓ UST-1		1635		X	UST-1	6X40m	X				X	
✓ TB		1800		X	TB-2 - 4/6/98	1X40m	X					
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Relinquished by: (Signature)		Date / Time		Received by: (Signature)		
M. Schur		4/7/98 1200		FED-X								
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Relinquished by: (Signature)		Date / Time		Received by: (Signature)		
Relinquished by: (Signature)		Date / Time		Received for Laboratory by: (Signature)		Date / Time		Remarks				
				S. Giana		4/8/98 930AM		FED-X B/L # 804733300967				

[illegible]

CHAIN OF CUSTODY RECORD

75 Hawthorne Street
San Francisco, California 94105

PROJ. NO.		PROJECT NAME				NO. OF CON- TAINERS	ANALYSIS						REMARKS
KJ9103		WDI TANK ASSESSMENT					VOCs EPA 8260 PEST/PCBs EPA 8080 HEAVY METALS SVOCs EPA 8270 TOTAL CYANIDE EPA 9010B TPH (grd) * EPA 8015**						
SAMPLERS: (Signature) <i>M. Schumacher</i>													
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION								
ST-1	4/6	1420		X	ST-1A	2x4oz	X	X	X	X	X		
ST-1		1425		X	ST-1B		X	X	X	X			
ST-2		1445		X	ST-2A		X	X	X	X			
ST-2		1451		X	ST-2B		X	X	X	X			
ST-3		1520		X	ST-3A	1x1L.				X		NaOH pH>12	
ST-3		1520		X	ST-3A	1x1L.		X	X				
ST-3		1520		X	ST-3A	1x1L.	X						
ST-3		1520		X	ST-3A	6x40ml	X						
ST-3		1525		X	ST-3B	2x1L.		X	X	X		NaOH pH>12 ON 9010 ANALYSIS	
ST-3		1525		X	ST-3B	1x1L.	X	X					
ST-3		1525		X	ST-3B	4x40ml	X			X		* AS REQUESTED IN CONTRACT W/	
ST-3		1530		X	ST-3C	2x1LIT.		X	X			SOUND LABORATORY	
ST-3		1530		X	ST-3C	1x1L.	X						
ST-3		1530		X	ST-3C	4x40ml	X						
TB		1800		X	TB-1-4/6/98	1x40ml	X						

Relinquished by: (Signature) <i>M. Schumacher</i>	Date / Time 4/7/98 1200	Received by: (Signature) FED-X	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) <i>S. Siano</i>	Date / Time 4/8/98 930AM	Remarks FED-X B/L # 804733300967	

SOUND ANALYTICAL SERVICES, INC.

Client: Ecology & Environment, Inc.

Date: April 28, 1998

Project: KJ9103 WDI Tank Assessment

Lab No.: 71868

GASOLINE RANGE ORGANICS

Samples 71868-1, 71868-4 through 71868-5, 71868-19 and 71868-21 (soils) and 71868-8, 71868-11, 71868-14, 71868-18, 71868-26, 71868-29 and 71868-32 (liquids) were analyzed for gasoline range organics in accordance with EPA Method 8015 Modified. The soil sample were extracted on 4-16-98 and analyzed on 4-17-98. The liquid samples were prepared on 4-16-98 and analyzed on 4-17-98.

Sample 71868-14 was received with a pH of 6. Sample 71868-18 was received with a pH of 5.

All quality control was within the acceptance limits.

Waters
quant value x dilution factor

Soils
$$\frac{\text{quant. Value} \times \text{dilution factor} \times 10 \times 40}{\text{sample weight} \times \text{percent solids}}$$

DIESEL RANGE ORGANICS

Samples 71868-1, 71868-3 through 71868-5, 71868-19 and 71868-21 (soils) were analyzed for diesel range organics in accordance with EPA Method 8015 Modified. Several liquid samples were noted on the chain of custody for diesel range organic analysis. Insufficient sample volume was submitted for the liquid analysis and therefor canceled. The soil samples were extracted on 4-20-98 and analyzed on 4-21-98.

The contaminant present in samples 71868-1, 71868-4, 71868-5 and 71868-21 did not appear to be typical diesel range product. The elution pattern suggests that it may be heavy oil.

The contaminant present in sample 71868-3 did not appear to be typical diesel range product.

All quality control was within the acceptance limits.

$$\frac{\text{Instrument reading} \times \text{final volume} \times \text{dilution factor}}{\text{sample weight or volume} \times \text{dry weight}}$$

TOTAL METALS

Samples 71868-1 through 71868-5, and 71868-19 through 71868-22 (soils) and 71868-6, 71868-9, 71868-12, 71868-16, 71868-24, 71868-27 and 71868-30 (liquids) were analyzed for CA metals in accordance with EPA Methods 7470/7471/6010. The soil samples were digested on 4-9-98 and 4-13-98 and analyzed on 4-10-98 and 4-13-98. The liquid samples were digested and analyzed on 4-10-98.

The percent recoveries of antimony, lead and zinc in the matrix spike analyses of sample 71868-1 exceeded the control limits. The sample was reanalyzed with similar results. Matrix interference is indicated by the post digest spike percent recoveries.